ELSEVIER Journal of Banking & Finance 22 (1998) 821–845

Journal of BANKING & FINANCE

Small business lending and the changing structure of the banking industry [1]

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Abstract

This study investigates the relationship between bank lending to small businesses, banking company size and complexity, and bank consolidation. We consider two potential influences on small business lending associated with changes in the size distribution of the banking sector. On the one hand, organizational diseconomies may increase the costs of small business lending as the size and complexity of the banking company increases. On the other, size-related diversification may enhance lending to small businesses. We find first that small business loans per dollar of asset rises, then falls, with banking company size, while the level of small business lending rises monotonically with size. Second, consolidation among small banking companies serves to *increase* bank lending to small businesses, while other types of mergers or acquisitions have little effect. We interpret these findings as consistent with the diversification hypothesis.

JEL classification: G21; G34

Keywords: Bank mergers; Small business lending

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[1] The views in this paper are the authors' and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.

0378-4266/98/$19.00
PII S0378-4266(98)00010-7

1. Introduction

Consolidation is sweeping the banking industry. High profile mergers and acquisitions, like the recent merger of Chemical Bancorp and Chase Manhattan, are reflective of a trend towards consolidation at all levels of the banking industry. One of the forces driving this increased consolidation is deregulation of restrictions on geographical expansion, which was recently completed with passage of the Riegle–Neal Interstate Banking and Branching Efficiency Act of 1994 (IBBEA). IBBEA allows banks to form bank and branch networks across state lines. [2] While IBBEA could enable banks to cut costs and increase efficiency, this deregulation has met with some degree of political opposition. [3] In 1995, the Texas State legislature voted to opt out of the interstate branching part of IBBEA; opponents cited a concern that interstate branching would have a negative impact on the availability of credit to small businesses and communities. [4]

Given these policy concerns, we ask the following question: what is the relationship between the size and complexity of a banking company and its ability to originate and hold small business loans? Clearly, consolidation will result in larger, more complicated banking companies. If such companies have higher costs of lending to small businesses, then it may follow that availability of credit to small businesses will be harmed by consolidation. Of course, even if costs do rise with size and complexity, small business lending need not generate any change in the long-run supply of credit to small businesses – it may simply mean that small banks have a cost advantage in providing such loans. Perhaps small business lending will provide the anchor that allows small banks to remain competitive.

To answer this question, we first look at the cross-sectional relationship between the size and complexity of banking companies and the amount of small business loans held on their balance sheets. We find that small business lending first increases, then decreases as a share of total assets as the average size of a banking company's subsidiaries increases. The *level* of lending to small businesses, however, increases monotonically with size. More generally, there is a positive relationship between bank size and overall business lending, consistent with the idea that diversification enhances a bank's (and thus a banking company's) ability to lend to both small and large businesses. As banks grow,

[2] Some states, such as New Jersey, opted in to IBBEA's interstate branching provision early. Texas and Montana are the only states that opted out of interstate branching.

[3] Jayaratne and Strahan (1996) find that economic growth rates accelerated following deregulation of state-level restrictions on branching; Jayaratne and Strahan (1998) find that bank loan quality improves and the price of bank loans falls after state-level branching deregulation.

[4] For an explanation of the causes of deregulation of restrictions on bank expansion, see Kroszner and Strahan (1997).

small business lending increases rapidly at first, thereby increasing the ratio of small business loans to assets; later, as banks get larger, lending to large businesses takes off, thereby lowering the ratio of small business loans to assets (although not the overall level of small business lending).

Given these results, it seems unlikely that consolidation will adversely affect the supply of small business lending from banks. Nevertheless, we ask a second question: how has small business lending changed after banking company mergers or acquisitions? Or, should small businesses be opposed to the ongoing changes in the structure of the banking industry? Our evidence suggests no. On the contrary, small business lending per dollar of assets actually *increased* after mergers and acquisitions between small banking companies. We find no significant change following mergers or acquisitions between medium-sized and large banking companies.

A number of recent papers have reached different conclusions regarding the impact of bank mergers and acquisitions on small business lending. Peek and Rosengren (1996) find that small business lending falls following mergers based on a small sample of mergers (13) that occurred in New England during 1993–1994, although they do not provide a formal test of this result. Keeton (1996) finds that business loans fall when out-of-state bank holding companies acquire banks based on data from the 10th Federal Reserve District. In contrast, Peek and Rosengren (1998) find that small business lending often increases after mergers and argue that this occurs because acquiring banks tend to do more small business lending than non-acquirers. Large banks with few small business loans generally do not purchase small banks that engage heavily in such lending. Berger et al. (1998) find that small business lending increases following small bank mergers but falls following large bank mergers.

Our results are most consistent with the Berger et al. findings, although we find no statistically significant change in the ratio of small business loans to assets following large merger/acquisitions. Our approach differs from all of these papers' in that we focus on changes at the banking company level rather than the bank level. In our view, intra-company loan sales can make bank-level comparisons misleading. Demsetz (1996) shows that banks owned by multi-bank holding companies are more likely to buy and sell loans. Small banks owned by multi-bank holding companies are therefore likely to hold fewer of their small business loan originations on their books than stand-alone banks originating the same volume of small business loans. We may therefore observe a decline in a bank's *holdings* of small business loans after it is purchased by a multi-bank holding company even if that bank's *originations* have not changed. Aggregation to the highest-holder level eliminates this problem.

The remainder of the paper proceeds as follows. Section 2 explores patterns in small business lending. We discuss the importance of relationships upon which banks lend to their smaller borrowers and contrast this with lending to larger borrowers with well-established credit histories. Section 3 provides a

profile of the small business lending market. Next, we consider the effects of banking company size and complexity on small business lending, followed by our analysis of the impact of bank consolidation. We end with some concluding remarks.

2. Lending patterns and relationship loans

Banks are a primary source of credit for small firms. While large, publicly traded firms have access to capital markets, small businesses rely heavily on banks for credit. According to the 1993 National Survey of Small Business Finance, banks supply more than 60 percent of small business credit (see Cole et al., 1996, Table 4).

Small businesses tend not only to borrow from banks but also to concentrate their borrowing at a single bank with which they have a long-term relationship. The nature of these relationships is an important feature of small business lending. Since there may be little public information available on small firms, relationships enable banks to collect private information on the credit worthiness of small firms. Petersen and Rajan (1994) and Berger and Udell (1995) show that small firms that develop banking relationships benefit by borrowing at lower interest rates and relying less on expensive trade credit as a source of short-term financing. Development of private information on small firms is mutually beneficial since it reduces the cost to banks of making loans, and consequently increases credit availability.

Berger and Udell (1996) argue that because of the importance of long-term financial relationships, the technology of lending to small businesses differs fundamentally from the technology of other types of lending. Larger firms with well-established track records may be able to borrow based on readily-observable information. Similarly, most residential real estate as well as consumer lending is now based on credit scoring models. On the other hand, small business (relationship) loans may require tighter control and oversight over loan officers by senior management than do loans based on simple ratio analyses or credit scoring models. [5] As a consequence, the complexity of large banks may lead to organizational diseconomies that make relationship loans

[5] In the past year, however, anecdotal evidence suggests that banks are beginning to lend to small business based on easily-obtained financial information. Wells Fargo has been using credit scoring to approve small business loans. As a result of their national solicitation campaign, their portfolio of small business loans rose by about one-third between June 1995 and June 1996. (This calculation adjusts for the effects of Wells' purchase of First Interstate.) Moreover, Levonian (1997) finds that these credit scoring technologies have been applied mainly to very small business loans, those under $100,000, and have facilitated rapid expansion of these loans by very large banking companies in the 12th Federal Reserve District.

more costly for them. Since senior management of small banks can monitor lending decisions closely, they can authorize more non-standard, relationship loans. If increases in the size of the banking company raise the relative cost of internal monitoring, then there may be organizational diseconomies associated with small business lending.

As evidence, Berger and Udell (1996) show that interest rates on small business loans originated by small banks tend to be higher than small business loans originated by large banks. They infer that small banks are making more relationship loans which require a higher interest rate to compensate for their greater risk and higher cost. An alternative interpretation, however, is that large banks have lower costs than small banks that they pass along to their small business borrowers in the form of lower interest rate and collateral requirements. Since the loan survey data provide no information about borrower attributes other than the loan size, it is difficult to reject either interpretation.

Size-related diversification may offset these potential organizational diseconomies. A large bank's superior ability to diversify credit risks across borrowers reduces the (agency) cost associated with delegated monitoring because the bank manager's effort is more easily inferred from its portfolio return when risks are better diversified (Diamond, 1984). While this effect is present for all kinds of risky lending, it may be insufficient to overcome organizational diseconomies associated with small business lending. The economy of scale stemming from diversification is likely to be dominant, however, for large business lending since these do not seem to generate serious monitoring problems inside the firm. Access to an internal capital market also may facilitate lending by larger banking organizations. Houston and James (1998) find that external capital is more expensive than internal capital for banks. As a result, an internal capital market insulates the loan supply of small banks affiliated with large holding companies from balance sheet shocks. They also find that the loan supply of small affiliated banks is more sensitive to local economic conditions than that of small unaffiliated banks.

Notwithstanding possible cost differences between large and small banks, it is clear that small banks' concentration on small business lending is forced by regulatory lending limits. Nationally chartered banks are prevented from lending more than 15 percent of their total capital to any single borrower. State-chartered banks face similar lending limits, although these vary based on state regulations (Spong, 1994). As noted above, of course, even absent such regulations, small banks would generally avoid very large loans in order to preserve adequate diversification.

In summary, there are two potential forces that would tend to affect the relationship between banking company size and lending. First, diversification reduces delegated monitoring costs and improves internal capital markets; these effects should lower the costs of risky lending as size increases. Second, organizational diseconomies associated with size and complexity may increase

the relative costs of small business (relationship) lending as size and complexity increase.

3. A profile of small business lending

3.1. Small business loan data

In June 1993, the federal banking agencies began collecting data on small bank loans to businesses. This information appears annually in the June *Report of Condition and Income* (the Call Report) filed by all commercial banks. The data are collected for three size categories of loans: those whose "original amounts" are $100,000 or less, $100,001 to $250,000, and $250,001 to $1,000,000. For the remainder of the paper, we will refer to all commercial and industrial (C&I) loans with original amounts under $1 million as "small business loans". [6] While loan size provides a good proxy for borrower size (Berger and Udell, 1996), we caution the reader that other financial intermediaries such as finance companies do provide significant credit to small businesses. The long-run impact on the supply of credit to small businesses of changes in the structure of the banking industry will therefore depend not only on how structural changes affect the costs of lending for banks but also on how non-bank lenders react to those changes.

The Call Report data enable us to compare the recent small business lending activity of large and small banking companies. Banking companies are constructed from the Call Report data by aggregating all individual banks that are owned by the same banking company. This aggregation to the highest level of the organizational structure is preserved throughout our study. We do this for two reasons. First, intra-company transactions have the potential to generate a correlation between small business lending, as well as other variables, across affiliated banks; this would complicate statistical analyses of bank-level data. Second, intra-company transactions could actually bias our results. We are interested in how the size and complexity of a banking company affects small business lending. Previous research has found, for instance, that small banks

[6] We define small business loans by the loan's original amount, rather than by actual borrower size, since this is how the data are collected. The original amount is defined under the following guidelines: For loans drawn under commitment, the original amount is the size of the line of credit or loan commitment when the line of credit or loan commitment was most recently approved, extended, or renewed before the report date. If the amount outstanding as of the report date exceeds this size, however, the original amount is the amount currently outstanding on the report date. For loan participations and syndications, the original amount is the entire amount of credit originated by the lead lender. For all other loans, the original amount is the total amount of the loan at origination or the amount outstanding as of the report date, whichever is larger.

that are owned by large multi-bank or multi-office holding companies engage less in small business lending (Keeton, 1995; Strahan and Weston, 1996). These results could reflect such intra-company transactions, however, if the small banks within a holding company tend to sell a fraction of their small business loan originations to affiliated banks. In fact, Demsetz (1996) shows that banks affiliated with multi-bank holding companies are more likely to buy and sell loans than independent banks or banks owned by single-bank holding companies, suggesting that intra-company loan sales are quantitatively important. We avoid this problem by first aggregating the data to the banking company level. [7]

3.2. Cross-sectional lending patterns

As shown in Panel A of Table 1, large banking companies hold a substantial share – 52.3 percent in June 1996 – of bank lending to small businesses, although this share falls well below their 91 percent share of large business lending (not shown). In contrast, small banking companies focus primarily on small business lending – those with assets under $300 million hold less than 2 percent of large business loans (not shown) but hold about 26 percent of all banks' small business loans. [8]

Panel B of Table 1 shows that the share of total assets devoted to small business loans first rises, then falls, with the size of the banking company. [9] Panel B also shows that the level of small business lending increases monotonically with banking company size. Taken together, these patterns are consistent with the idea that size-related diversification enhances both large and small business lending as size increases. As banks initially grow, diversification lowers the cost of lending to small businesses, leading to an increase in the small business loans to assets ratio. But until banking companies reach a certain size, they are essentially shut out of the market for lending to large businesses. After banking companies become large enough, lending to large businesses takes off, thereby lowering the ratio of small business loans to assets, although not the overall level of small business lending. Note that the increase in the level of small business lending is not consistent with the organizational

[7] Note that more than 85% of our observations are stand-alone banks or single-bank holding companies.

[8] When we use the term "assets" here and subsequently we refer to the sum of all gross domestic assets held by bank subsidiaries of the highest-holder (bank or bank holding company) from the June Call Reports.

[9] Levonian and Soller (1996) also document that small business lending first rises, then falls, with the size of the bank.

Table 1
Profile of small business lending, 1993–1996

Panel A: Share of bank lending to small businesses, by banking company asset size

Banking company domestic assets	1993 (percent)	1994 (percent)	1995 (percent)	1996 (percent)
Less than $100 million	14.4	14.1	13.1	11.7
$100 million–$300 million	14.6	15.0	14.5	14.5
$300 million–$1 billion	10.8	10.3	10.9	11.0
$1 billion–$5 billion	12.5	11.7	11.0	10.5
Over $5 billion	47.7	48.9	50.6	52.3
Total	100	100	100	100

Panel B: Importance of small business loans in banking company portfolios, by banking company asset size

Banking company domestic assets	1993		1994		1995		1996	
	Share of assets (percent)	Average amount held (Mill $s)	Share of assets (percent)	Average amount held (Mill $s)	Share of assets (percent)	Average amount held (Mill $s)	Share of assets (percent)	Average amount held (Mill $s)
Less than $100 million	8.6	3.6	8.6	3.7	9.1	4.0	9.2	4.1
$100 million–$300 million	9.0	14.6	8.9	14.5	9.1	14.7	9.3	15.0
$300 million–$1 billion	8.1	40.9	7.4	37.9	8.0	40.7	8.3	41.7
$1 billion–$5 billion	6.1	134.8	5.8	126.7	5.7	124.7	5.9	124.1
Over $5 billion	3.5	832.7	3.2	819.9	3.3	866.9	3.4	1,024.3
All banking companies	5.0		4.6		4.6		4.7	

Sources and notes: Data are from the June Reports of Income and Condition, 1993–1996. Loans to small business are commercial and industrial loans with original amount under $1 million.

diseconomies hypothesis, unless the composition of small business loans changes as size increases, as argued by Berger and Udell (1996). [10]

4. Size, complexity and small business lending

In Section 3, we analyzed the relationship between banking company size and small business lending. Our results are more consistent with the idea that diversification enhances bank lending, both small and large, as size increases rather than the idea that organizational diseconomies reduce small business lending with increases in size. With these results in mind, we now look at the relationship between the size and complexity of banking companies and small business lending in a multivariate setting.

If there are organizational diseconomies associated with small business lending, then such lending ought to become more costly, and hence decline, with increases in both banking company size and complexity. To test this notion, we first segregate banking companies into two general categories: single-bank and multi-bank banking companies. Further, multi-bank banking companies are segregated into single-state and multi-state banking companies. We assume that organizational complexity increases from single-bank to multi-bank banking companies and from single-state to multi-state banking companies.

As reported in Table 2, the mean ratio of small business loans to assets generally *increases* with organizational complexity. These results, which are inconsistent with the idea that organizational diseconomies are important, are robust across all but the smallest size category and across all four years in the sample. [11] This result may occur, however, because multi-bank holding companies of a given size hold smaller banks, on average, than single-bank banking companies of similar size. Perhaps the size of the bank subsidiary matters, rather than the size of the holding company.

To address the issue of bank subsidiary size directly, we construct a variable equal to the average size of the bank subsidiary in the banking company structure. According to the organizational diseconomies hypothesis, a banking company that holds many small subsidiaries should supply fewer small business loans than a banking company that holds one or two large subsidiaries.

[10] We also looked initially at small commercial real estate loans, again defined as commercial real estate with original amounts below $1 million. These are similar in nature to small business loans except that they are secured by property. In fact, we found in this and the subsequent analyses that small commercial real estate behaves in much the same way as small business lending. For this reason, we present only the small business lending. The results for small commercial real estate are available on request, however.

[11] Table 2 reports data from 1996. Patterns for 1993–1995 are very similar.

Table 2
Mean small business loans to assets ratio by banking company size and complexity

Banking company domestic assets	Single-bank banking companies	Multi-bank banking companies	
		Single state	Multi-state
	(1)	(2)	(3)
Less than $100 million	0.088	0.089	0.077
	(0.001)	(0.004)	(0.007)
$100 million–$300 million	0.093	0.093	0.105
	(0.002)	(0.003)	(0.009)
$300 million–$1 billlion	0.076	0.096	0.105
	(0.003)	(0.004)	(0.008)
$1 billion–$5 billion	0.050	0.070	0.076
	(0.005)	(0.006)	0.005)
Over $5 billion	0.034	0.044	0.047
	(0.006)	(0.013)	(0.003)

Sources and notes: Data are from the June Report of Income and Condition, 1996. Loans to small business are commercial and industrial loans with original amount under $1 million. Standard errors are in parentheses.

This interpretation is tested explicitly in Table 3, where we look at the size/complexity relationship using a regression approach. The ratio of small business loans to assets as well as the log of the level of small business loans are regressed on four sets of variables: [12] an indicator equal to one for banking companies with more than $300 million in domestic assets, the interaction of two size indicators (over and under $300 million) with the log of the average total assets of the bank subsidiaries owned by the banking company, the interaction of the two size indicators with the log of the number of subsidiaries, and the interaction of the two size indicators with the log of the number of states in which the banking company operates at least one bank subsidiary. [13] Note that since the log of average subsidiary assets plus the log of the number of subsidiaries equals the log of total banking company assets, if the coefficient on the log of average bank subsidiary assets equals the coefficient on the log of the number of bank subsidiaries, then only the size of the banking company matters.

The first set of regressions indicates that for small banking companies an increase in the average size of its subsidiaries is associated with an increase in small business lending per dollar of assets. This finding is consistent with the idea that as small banks grow, they are better able to diversify their

[12] In the log specification, we add one to the level of small business lending since some banking companies in our sample had no small business loans.

[13] We have also estimated a similar model using five size categories corresponding to those in Tables 1 and 2. These results suggested that the natural break in the relationship occurs at about $300 million in domestic assets.

Table 3
Regression of small C&I lending on banking company size and structure

Explanatory variable	Small business loans to assets				Log of (1+small business loans)			
	1993	1994	1995	1996	1993	1994	1995	1996
Intercept	0.297	0.270	0.315	0.312	3.832	3.375	4.507	5.312
	(8.09) *	(7.74) *	(9.46) *	(9.31) *	(5.26) *	(4.85) *	(6.70) *	(7.63) *
Banking Company Size Indicators:								
Under $300 million	−0.304	−0.268	−0.316	−0.306	−8.321	−7.809	−8.738	−9.559
	(8.04) *	(7.41) *	(9.14) *	(8.75) *	(11.08) *	(10.86) *	(12.50) *	(13.19) *
Size Indicators ∗ Ln (Average assets of Subsidiaries):								
Under $300 million	0.009	0.008	0.008	0.008	1.153	1.149	1.135	1.138
	(9.98) *	(8.99) *	(9.46) *	(8.53) *	(67.82) *	(68.05) *	(64.53) *	(61.03) *
Over $300 million	−0.017	−0.015	−0.018	−0.018	0.452	0.481	0.404	0.340
	(6.10) *	(5.83) *	(7.34) *	(7.19) *	(8.35) *	(9.31) *	(8.10) *	(6.58) *
Size Indicators ∗ Ln (Number of Banks Subsidiaries):								
Under $300 million	0.001	0.004	0.003	0.002	1.236	1.241	1.220	1.216
	(0.32)	(1.33)	(0.94)	(0.52)	(18.49) *	(18.80) *	(17.79) *	(16.50) *
Over $300 million	−0.010	−0.006	−0.008	−0.006	1.036	1.068	0.969	0.967
	(2.31) *	(1.48)	(1.91)	(1.40)	(12.24) *	(12.83) *	(11.29) *	(10.34) *
Size Indicators ∗ Ln (Number of States):								
Under $300 million	−0.003	0.011	0.003	0.006	−0.244	0.160	−0.119	−0.053
	(0.20)	(0.86)	(0.25)	(0.52)	(0.89)	(0.64)	(0.47)	(0.21)
Over $300 million	0.010	0.007	0.010	0.011	0.495	0.446	0.615	0.765
	(1.19)	(0.91)	(1.25)	(1.31)	(2.98) *	(2.78) *	(3.83) *	(4.45) *
N	8,509	8,123	7,706	7,423	8,509	8,123	7,706	7,423
R-squared	1.87%	2.06%	2.50%	2.34%	49.44%	50.67%	50.26%	48.14%

Sources and notes: Based on authors' calculations from data in the June 1993–96 Reports of Income and Condition. *T*-statistics appear below coefficients in parentheses.

* Statistically significant at the 5 percent level.

portfolios. [14] For large banking companies, we see a negative relationship between average bank subsidiary size and the ratio of small business loans to assets. The total number of subsidiaries held by a banking company, however, is *not* statistically significant related to small business lending per dollar of assets for either large or small banking companies. Nor is the number of states in which the company operates. [15] Moreover, we find no evidence that the overall size of the banking company is correlated with small business lending – only the average size of a banking company's subsidiaries seems to matter. Another way of stating this result is: holding constant the average bank size, small business lending per dollar of assets is uncorrelated with the size of the banking company. Thus, the complexity of a banking company seems to be unrelated to its lending to small businesses.

The second specification suggests, again, that the *level* of small business lending increases, both with the average size of a banking company's subsidiaries as well as with the number of subsidiaries. For small banking companies, small business lending increases faster than total assets. Moreover, a doubling of the number of bank subsidiaries more than doubles the amount of small business loans held by small banking companies. Diversification within and across banks of small banking companies seems to enhance small business lending.

For large banking companies, small business lending increases, although at a decreasing rate, with average bank size. The regression suggests that a 10 percent increase in bank assets is associated with about a 4 percent increase in small business lending. By contrast, their small business loans rise in direct proportion to the number of subsidiaries (i.e., we cannot reject at the 5 percent level the hypothesis that the coefficient on the number of bank subsidiaries equals 1). Again, this suggests that increasing the complexity of a banking company has no adverse effect on its ability to lend to small businesses. Moreover, the regressions in levels suggest that multi-state banking companies lend more to small businesses than single-state banking companies.

To summarize, the results suggest that size-related diversification enhances lending to small businesses for small banking companies. In both specifications, the share of assets held in small business loans increases with average bank size up to $300 million (i.e., in the levels regressions the coefficient on the log of bank assets is statistically significantly different (greater) from one). Small business lending also increases more than in proportion to increases in the number of bank subsidiaries in the levels regressions, while we find a positive but statistically insignificant relationship between the number of

[14] For evidence that size enhances bank diversification, see Demsetz and Strahan (1997).

[15] Whalen (1995) also finds no adverse effects of out-of-state ownership on small business lending by banks in Illinois, Kentucky, and Montana.

subsidiaries and the share of assets held as small business loans. For large banking companies, it appears that size-related diversification at the bank level enhances lending to large businesses, resulting in a slow increase in small business lending with size and a decline in the share of small business loans in the portfolio. In fact, the share of lending to large businesses increases faster than assets for large banking companies (not shown). [16]

5. Bank consolidation and small business lending

To test directly whether consolidation leads to increases or decreases in small business lending, we construct a sample of 563 banking companies active in merger and/or acquisition activity (M&A) – that is, survivors of a merger or banking companies acquiring other banks and continuing to operate them as separately-chartered banks – and compare changes in their small business lending before and after the consolidation with banking companies not involved in any M&A activity over the same period. To make the comparisons across time for the banking companies active in M&A, we construct a pro-forma banking company for each acquirer by summing the assets and liabilities of all of its bank subsidiaries as well as all of the banks that it acquired between 1 July 1993 and 30 June 1996 as of 30 June 1993 (before any of the M&A activity had actually occurred). This pro-forma banking company provides the benchmark to which we compare changes in small business lending before and after the merger with comparable changes for banking companies not involved in M&A. [17]

Since the analysis is performed at the banking company level and not at the bank level, we identify the highest (in the organizational structure) holder of each bank at the end of the sample. That is, if a bank is merged into another in 1994 and the surviving bank is then the target of an acquisition in 1995, we isolate the banking company that ends up holding that bank in June 1996. This approach allows us to compare pro-forma figures in 1993 with the actual banking company data in 1996 after controlling for all organizational changes.

To identify which banking companies were acting as acquirers during the period requires some explanation. Mergers between two banks are identified

[16] For large banking companies, lending to large businesses rises almost twice as fast as assets. That is, a 10 percent increase in bank assets is associated with an increase in lending to large businesses of close to 20 percent. These results are available on request.

[17] During 1993 there were some problems with the smallest category of these loans due to ambiguity in the instructions to banks. These problems seem to have been corrected starting in 1994. The data for loans under $1 million appears to be generally accurate for all four years. Note, however, that we have performed the analysis on changes in bank lending following mergers using data from 1994 to 1996 and found similar results.

using the National Information Center's (NIC) transformations table. This database provides a reliable source of all regulatory petitions for bank mergers. Since there is no similar regulatory database for bank acquisitions, we identify acquisitions by looking at changes in the organizational structure of banks across time. Acquisitions are identified by changes in the highest holding company of a bank that preserves its charter. If a bank leaves the sample through a merger, the owner of the purchasing bank is assigned to the exiting bank.

5.1. Difference in means approach

To analyze the effects of consolidation on lending, we first compare changes in the ratio of small business lending to assets, total business lending to assets and small business lending to total business lending for the M&A banking companies with a matched sample of banking companies not involved in M&A activity. We construct our matched sample by randomly selecting one non-merging banking company for each of the acquiring banking companies with total domestic assets within 10 percent of the pro-forma banking company's domestic assets as of the beginning of the period (1993). Since we do the matching without replacement, we were only able to match 489 of the 563 acquirers. [18]

Table 4 reports these results. The changes for banking companies involved in M&A represent the average difference between the pro-forma banking company's ratio of small business loans to assets in June 1993 and the newly-merged banking company's actual ratio of small business loans to assets in June 1996. The ratio of small business loans to assets for the pro-forma banking company in 1993 is a measure of the expected amount of small business lending for the newly merged banking company provided that no change occurs in the target bank's propensity to engage in small business lending. If the new management of the target reduces its small business lending following the merger (perhaps because of organizational diseconomies), the ratio of small business loans to assets will decline from 1993 to 1996; if management increases small business lending (perhaps because of diversification), we should see an increase in that ratio.

As shown in panel A, the average ratio of small business loans to assets *rises* 0.59 percentage points for banking companies involved in M&A activity. By contrast, the average ratio rises only 0.06 percentage points for banking companies of similar size not involved in M&A. The difference in the change in

[18] A more sophisticated matching technique might also control for location and initial small business lending intensity. However, this technique results in a serious loss of observations. We leave these controls to the regression analysis presented in Tables 5 and 6.

the ratio of small business loans to assets is statistically significant at the five percent level. The next row of Table 4, panel A shows that overall business lending, large and small, also rises. [19] The M&A banking companies' ratio of total business loans to assets rises by 1.27 percentage points, or 0.53 percentage points more than the 0.74 percentage point increase for the comparison group. By contrast, both groups experienced a decline of similar magnitude in the ratio of small business lending to total business lending. This occurs because lending to large business began growing rapidly following the end of the so-called credit crunch of 1991–1993 before small business lending began to grow. Note that this appears to be the typical pattern following cyclical downturns (Berger et al., 1995).

We have shown above that the cross-sectional relationship between bank subsidiary size and small business lending depends on the size of the banking organization. For small companies, bank size is positively correlated with the share of small business loans in the portfolio – we interpret this as a diversification effect. At the high end, however, there is a negative correlation between bank size and the importance of small business lending in the portfolio, although the level of small business lending rises continuously with size. Given these cross-sectional patterns, it seems plausible that the impact of consolidation may differ across various types of mergers/acquisitions.

Panel B of Table 4 investigates changes in small business lending after accounting explicitly for the average size of the target(s) and the size of the acquiring banking companies. Here, we define a "small" banking company as one with domestic assets under $100 million, a "medium-sized" banking company as one with assets between $100 million and $1 billion and a "large" banking company as one with assets over $1 billion. In the table we report changes in small business loans to assets for cases in which small and medium-sized banking companies are targets of mergers. We do not, however, have enough cases where large banking companies were targets to get meaningful results. [20]

As shown, the increase in small business lending seen in Panel A is driven by the acquisition of small banking companies. Mergers that targeted small banking companies increased the proportion of total assets devoted to small business lending relative to the control group, regardless of the size of the acquirer. Only the small target/medium-sized acquirer combination, however, is statistically significant. Mergers targeting medium-sized banking companies have mixed results, but the low number of observations in these categories

[19] Akhavein et al. (1997) find that profit efficiency increases following bank mergers because of an increase in the loans-to-assets ratio. (Loans are profit enhancing.)

[20] In cases where more than one banking company is acquired, we define the size of the target as the average size of all banking companies acquired.

Table 4
Comparison of changes in small business lending for banking companies involved in M&A with those not involved in M&A

Panel A: Basic merger analysis

		Banking companies involved in M&A	Banking companies not involved in M&A	T-stat
Small C&I loans/ total assets	Mean-change	0.59	0.06	2.14 *
	Standard deviation	(3.90)	(3.86)	
Total C&I loans/ total assets	Mean-change	1.27	0.74	1.95
	Standard deviation	(3.96)	(4.54)	
Small C&I loans/ total C&I loans	Mean-change	−4.37	−4.63	0.26
	Standard deviation	(13.79)	(17.50)	

Table 4 (Continued)
Panel B: Breakdown of small C&I loans/total assets by merger type

		Small targets			Medium sized targets		
		Banking companies involved in M&A	Banking companies not involved in M&A	T-stat	Banking companies involved in M&A	Banking companies not involved in M&A	T-stat
Small acquirers	Mean-change	1.38	0.82	1.36	−0.73	1.57	−0.94
	Standard deviation	(4.33)	(3.84)		(6.42)	(2.61)	
	N	[197]	[197]		[8]	[8]	
Medium-sized acquirers	Mean-change	0.41	−0.47	2.36 *	−0.82	−1.00	0.19
	Standard deviation	(3.46)	(4.10)		(4.34)	(3.44)	
	N	[204]	[204]		[35]	[35]	
Large acquirers	Mean-change	−0.56	−0.78	0.24	−0.78	−0.08	−1.43
	Standard deviation	(1.55)	(3.52)		(1.74)	(1.75)	
	N	[18]	[18]		[25]	[25]	

Sources and notes: All figures are in percent. Based on authors' calculations from data in the June 1993–1996 Reports of Income and Condition. The sample of banking companies involved in mergers or acquisitions includes 489 of the 563 banking companies that acquired or merged with another bank (or banks) between June 1993 and June 1996. Each of these banking companies was matched with another banking company not involved in any M&A activity during this period which had total assets within 10 percent of the pro-forma banking company at the beginning of the period (1993). Each banking company was used only once in this matching procedure. As a result, we were unable to find a matching banking company for 74 of the acquirers. There were two cases of large banking companies acquiring other large banking companies in our matched sample that are omitted due to the small sample size.

* Statistically significant at the 5 percent level.

makes it difficult to draw firm conclusions about the consequences of such mergers.

5.2. Regression approach

Table 5 presents a conceptually similar analysis of changes in lending between 1993 and 1996 using a multiple regression. The advantage to this approach is that we can use all banking companies not involved in M&A activity to construct a "control" group. We do this by regressing the change in three lending ratios – the ratio of small business loans to assets, total business loans to assets and small business loans to total business loans – on a merger/acquisition indicator variable and variables controlling for initial size and size squared. Also, since mergers may have distinct regional patterns, we include the 1993–96 growth rate of the average of state personal income, weighted by the banking assets held by the banking company in each state.

In a second specification, we add growth in assets over the period, the beginning of period capital-to-assets ratio, and the change in the number of subsidiaries owned by the banking company between 1993 and 1996. Asset growth is included to control for the possibility that banking companies involved in M&A activity are located in markets with unusually strong loan demand conditions. [21] We include the capital-asset ratio to control for the possibility that capital affects both the likelihood of acquiring banking assets during the period as well as a banking company's ability or willingness to increase its lending. [22] Finally, we include the change in the number of bank subsidiaries owned by the banking company over the 1993–1996 period. This variable allows us to test the hypothesis that changes in the complexity of the banking organization affect its ability to make small business loans. Note that this variable is affected both by banking company acquisitions of unaffiliated banks as well as mergers of affiliated banks.

As reported in Table 5, consolidation through mergers and acquisitions has a positive effect on the portfolio share of small business loans: banking companies that were involved in M&A increase their portfolio share of small business loans by more that half a percentage point. While ex-ante larger banking companies experience a smaller change in the ratio of small business loans to assets, the growth rate of total assets does not seem to affect this ratio. Economic conditions and the beginning of period capital-asset ratio both have a positive and significant effect. The effect of increased capital on small business

[21] Note that the growth rate of assets in this regression reflects only growth not associated with consolidation, since we use pro-forma data at the beginning of the period.

[22] Risk-based capital adequacy rules now directly link a bank's ability to lend to its capital-asset ratios.

Table 5
Regression of changes in banking company lending on bank merger indicator and other variables

Explanatory variables	Change in small C&I loans to assets		Change in total C&I loans to assets		Change in small C&I loans to total C&I loans	
Intercept	8.05	7.05	8.33	7.94	32.20	33.61
	(3.81) *	(3.05) *	(3.67) *	(3.20) *	(4.99) *	(4.81) *
Merger or acquisition indicator	0.63	0.62	0.76	0.75	−0.15	−0.12
	(3.00) *	(2.96) *	(3.40) *	(3.33) *	(0.24)	(0.19)
Beginning of period log of assets	−1.01	−0.89	−1.28	−1.21	−4.31	−4.54
	(2.84) *	(2.27) *	(3.34) *	(2.89) *	(3.98) *	(3.84) *
Beginning of period log of assets squared	0.02	0.02	0.04	0.04	0.12	0.12
	(1.60)	(1.17)	(2.78) *	(2.36) *	(2.52) *	(2.47) *
Growth in personal income by state	5.49	5.64	8.45	7.31	−8.33	−0.90
	(2.16) *	(2.20) *	(3.10) *	(2.66) *	(1.09)	(0.12)
Growth in total assets	–	−0.10	–	0.69	–	−4.97
	–	(0.50)	–	(3.07) *	–	(7.34) *
Change in the number of subsidiaries	–	−0.01	–	−0.01	–	0.02
	–	(0.12)	–	(0.14)	–	(0.22)
Beginning of period capital/asset ratio	–	2.26	–	0.11	–	0.63
	–	(2.09) *	–	(0.09)	–	(0.01)
N	7,200	7,200	7,200	7,200	7,107	7,107
R-squared	1.49%	1.55%	0.61%	0.74%	2.39%	3.13%

Sources and notes: Based on authors' calculations from data in the June 1993–1996 Reports of Income and Condition. The change in each of the lending ratios for banking companies involved in mergers or acquisitions between 1993 and 1996 is the difference between the relevant ratio for the pro-forma banking company in 1993 (before the mergers/acquisitions have occurred) and that ratio for the actual banking company in 1996 (after the mergers/acquisitions have occurred). Figures in parentheses are *t*-statistics.

* Statistically significant at the 5 percent level.

lending may reflect an easing of regulatory or market forces that tend to limit banking company risk taking. Finally, we find no effect of changes in the number of bank subsidiaries.

The second set of regressions in Table 5 investigate the effect of consolidation on total business lending. Changes in the ratio of total business lending to total assets are regressed on the same set of explanatory variables as above. Again, we find that banking companies involved in M&A activity are more likely to increase lending, controlling for size, growth, economic conditions, and capital. Banking companies involved in mergers increase their portfolio share of total business lending by about 0.75 percentage points. The final set of regressions look at the share of small business loans in total business lending. Consistent with Table 4, we find that mergers and acquisitions do not affect the proportion of total business loans devoted to small business lending. This presumably occurs because lending to both small and large businesses increase after mergers.

Table 6 reports a similar set of regressions which account explicitly for the average size of the target(s) and the acquiring banking companies with a set of indicator variables depending on the size of the acquirer and the average size of the target banking companies. In this specification we have an indicator for the 197 cases in which a small banking company acquired one or more small banking companies, another indicator for the 205 cases in which a medium-sized banking company acquired one or more small banking companies, and so on. As in Table 4, these indicators are based on the size of the acquirer and the average size of the target(s) at the beginning of the period. [23]

We continue to find that mergers involving small targets consistently increase the ratio of small business loans to assets. In the regressions, the ratio of small business loans to assets rises by about 0.95 percentage points when small banking companies merge, and this increase is statistically significant at the 5 percent level. Small business lending increases by about 0.55 percentage points when medium-sized banking companies acquire small ones, and this increase is statistically significant at the 10 percent level. When large banking companies acquire small ones, we estimate an increase in small business loans to assets of 0.31–0.35 percentage points, although this increase is not significant. [24]

The effect of M&A activity on small business lending, however, is not statistically significant when either medium-sized or large banking companies are

[23] There are seven such indicators, out of a maximum of nine; there were no cases of a small banking company acquiring a large banking company or a medium-sized banking company acquiring a large one.

[24] Adding the beginning of period *level* of small business loans to assets as a regressor increases the explanatory power of the regressions (from an R^2 of about 2% to an R^2 of about 15%) and increases the point estimates (and *t*-statistics) of the coefficients on the merger indicators.

Table 6
Regression of changes in banking company lending on indicators for merger type and other variables

Explanatory variable	Change in small C&I loans to assets		Change in total C&I loans to assets		Change in small C&I loans to total C&I loans	
Intercept	9.13	7.88	9.97	9.60	28.45	29.49
	(3.39) *	(2.78) *	(3.45) *	(3.15) *	(3.42) *	(3.41) *
Type of merger/acquisition Indicators:						
Small acquirer/small targets	0.96	0.95	1.13	1.14	0.23	0.14
(Number of cases = 197)	(3.13) *	(3.10) *	(3.43) *	(3.45) *	(0.25)	(0.16)
Medium-sized acquirer/small targets	0.56	0.55	0.67	0.65	−0.40	−0.28
(Number of cases = 205)	(1.78)	(1.76)	(1.99) *	(1.92)	(0.43)	(0.30)
Large acquirer/small targets	0.31	0.35	−0.20	−0.29	3.44	4.02
(Number of cases = 37)	(0.40)	(0.45)	(0.24)	(0.35)	(1.48)	(1.73)
Small acquirer/medium-sized targets	−0.60	−0.66	−0.75	−0.73	5.86	5.71
(Number of cases = 8)	(0.40)	(0.44)	(0.47)	(0.46)	(1.32)	(1.29)
Medium-sized acquirer/medium-sized targets	−0.40	−0.41	0.01	0.01	−4.81	−4.93
(Number of cases = 36)	(0.55)	(0.57)	(0.01)	(0.02)	(2.25) *	(2.31) *
Large acquirer/medium-sized targets	0.07	0.09	0.34	0.30	−0.12	0.07
(Number of cases = 66)	(0.10)	(0.13)	(0.45)	(0.39)	(0.05)	(0.03)
Small acquirer/large targets	–	–	–	–	–	–
(Number of cases = 0)	–	–	–	–	–	–
Medium-sized acquirer/large targets	–	–	–	–	–	–
(Number of cases = 0)	–	–	–	–	–	–
Large acquirer/large targets	0.19	0.33	−0.32	−0.30	2.71	2.68
(Number of cases = 14)	(0.13)	(0.23)	(0.20)	(0.19)	(0.61)	(0.61)
Beginning of period log of assets	−1.22	−1.06	−1.59	−1.53	−3.63	−3.79
	(2.58) *	(2.13) *	(3.13) *	(2.88) *	(2.48) *	(2.50) *
Beginning of period log of assets squared	0.03	0.03	0.06	0.06	0.08	0.09
	(1.66)	(1.28)	(2.68) *	(2.47) *	(1.32)	(1.35)
Growth in personal income by state	5.57	5.69	8.55	7.39	−8.47	−1.03

Table 6 (Continued)

Explanatory variable	Change in small C&I loans to assets		Change in total C&I loans to assets		Change in small C&I loans to total C&I loans	
	(2.19) *	(2.22) *	(3.13) *	(2.68) *	(1.11)	(0.13)
Growth in total assets	–	−0.10	–	0.70	–	−5.02
	–	(0.48)	–	(3.11) *	–	(7.40) *
Change in the number of subsidiaries	–	−0.01	–	−0.01	–	0.02
	–	(0.22)	–	(0.17)	–	(0.22)
Beginning of period capital–asset ratio	–	2.26	–	0.08	–	0.63
		(2.09) *		(0.07)		(0.14)
N	7,200	7,200	7,200	7,200	7,107	7,107
R–squared	1.55%	1.61%	0.67%	0.80%	2.54%	3.28%

Sources and notes: Based on authors' calculations from data in the June 1993–1996 Reports of Income and Condition. The change in each of the lending ratios for banking companies involved in mergers or acquisitions between 1993 and 1996 is the difference between the relevant ratio for the proforma banking company in 1993 (before the mergers/acquisitions have occurred) and that ratio for the actual banking company in 1996 (after the mergers/acquisitions have occurred). The indicators for the type of merger/acquisition are based on the beginning of period size of the acquirer and the average size of the target(s) at the beginning of the period. We define a "small" banking company as one with domestic assets under $100 million, a "mediumsized" banking company as one with assets between $100 million and $1 billion, and a "large" banking company as one with assets over $1 billion. Figures in parentheses are *t*-statistics.

* Statistically significant at the 5 percent level.

acquired. [25] Of course, it warrants repeating that the evidence on the impact of this kind of M&A activity is limited by the small number of times that medium-sized or large banking companies were acquired during our sample period. Nevertheless, these results suggest that opposition to interstate banking on the basis of credit availability to small firms may be misplaced. [26]

The results are similar for the ratio of total business lending to assets. Mergers or acquisitions between small banking companies and between medium-sized acquirers and small targets have a positive and statistically significant effect on total business lending as a proportion of assets. The effect of all other types of consolidation is again not statistically significant. Finally, the ratio of small business loans to total business loans remains unaffected by all types of consolidation except mergers between medium-sized firms. Mergers or acquisitions between medium-sized banking companies seem to reduce the share of loans devoted to small businesses. This result may stem from the fact that when two medium-sized banking companies merge, they become large enough to begin rapidly expanding their lending to large businesses – this expansion reflects the positive benefits of size-related diversification on large business lending rather than any negative effects on small business lending; there is no negative effect on the ratio of small business lending to assets for any category of M&A.

6. Conclusions

Concerns about the supply of credit to small businesses has recently received considerable attention in political and academic spheres. Looking ahead, we can probably anticipate further consolidation in the banking industry. Can we conclude that a decline in the presence of independently owned, small banks will have an adverse impact on the credit available to small businesses? Our evidence suggests that the answer is no. In cross-section, small business lending increases per dollar of assets until banking companies reach about $300 million

[25] When we estimate this model without controlling for initial banking company size, we continue to find a statistically significant and positive effect of small M&A activity on small business lending. For M&A involving medium-sized and large banking companies, we find a negative, although statistically insignificant, effect. This probably reflects the fact that lending to large businesses grew very rapidly after 1993, while lending to small businesses only began to grow after 1994, and only large banking companies are able to lend to large businesses.

[26] Peek and Rosengren (1998) have argued that a target bank's lending may adjust towards the lending of the acquiring bank. To test this hypothesis at the banking company level, we have included as a regressor the beginning of period difference between the pro-forma banking company's ratio of small business loans to assets and the acquiring banking company's ratio of small business loans to assets. This variable was not statistically significant in our model.

in assets. For larger banking companies, lending to large businesses increases rapidly with size, resulting in a slow increase in the *level* of small business lending but a decline in its importance in the portfolio. These patterns are consistent with the idea that size-related diversification enhances bank lending to both large and small businesses. More directly, we find that consolidation among small banking companies serves to *increase* bank lending to small businesses, while other types of mergers or acquisitions have little effect.

It is important to stress that our results address small lending by banks and not small business lending by other intermediaries such as finance companies. Our results also pertain only to changes in small business lending by those banking companies involved in merger and acquisition activity. Changes in credit supplied by one set of institutions may elicit a response from other institutions operating in the same market. So, for instance, if small business lending increases after a small bank is acquired (as occurred during our sample period), then other bank or non-bank competitors may decrease their lending to small businesses, perhaps leaving the market supply unchanged. Nevertheless, our findings do lend weight to the arguments made by proponents of interstate banking and branching. Looking ahead, we can probably anticipate further consolidation in the banking industry. If small banks continue to be acquired at a torrid pace, small firms may actually have an easier time getting bank credit.

Acknowledgements

We wish to thank Allen Berger, Joanne Collins, Rebecca Demsetz, Dorsey Farr, Beverly Hirtle, Jith Jayaratne, Lawrence Radecki, Richard Rosen, Marc Saidenberg, Gregory Udell, and seminar participants at the Federal Reserve Bank of New York and the University of Virginia.

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