The Effects of Bank Mergers and Acquisitions on Small Business Lending

Allen N. Berger
Board of Governors of the Federal Reserve System
Washington, DC 20551 U.S.A.
and
Wharton Financial Institutions Center
Philadelphia, PA 19104 U.S.A.

Anthony Saunders
Stern School of Business, New York University
New York, NY 10012 U.S.A.

Joseph M. Scalise
Wharton School of Business, University of Pennsylvania
Philadelphia, PA 19104 U.S.A.

Gregory F. Udell
Stern School of Business, New York University
New York, NY 10012 U.S.A.

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Please address correspondence to Allen N. Berger, Mail Stop 153, Federal Reserve Board, 20th and C Sts. NW, Washington, DC 20551, call 202-452-2903, fax 202-452-5295, or email aberger@frb.gov.

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Abstract

We examine the effects of bank M&As on small business lending. Our methodology permits empirical analysis of the great majority of U.S. bank M&As since the late 1970s -- over 6,000 M&As involving over 10,000 banks (some active banks are counted multiple times). We are the first to decompose the impact of M&As on small business lending into static effects associated with a simple melding of the antecedent institutions and dynamic effects associated with post-M&A refocusing of the consolidated institution. We are also the first to estimate the reactions of other banks in local markets to M&As. We find that the static effects of consolidation which reduce small business lending are mostly offset by the reactions of other banks in the market, and in some cases also by refocusing efforts of the consolidating institutions themselves.

I. Introduction

The liberalization of geographic restrictions on U.S. banking institutions beginning in the late 1970s has produced a rapid consolidation of the banking industry. From 1979 through 1994, there were over 3,500 mergers in which two or more banks were consolidated under a single charter, as well as more than 5,800 acquisitions in which banks retained their individual charters but became owned by different bank holding companies (BHCs) (see Table 1). As a result of this merger and acquisition (M&A) activity, the banking industry has been in a state of continuous transition. The consolidation activity has been particularly strong in the first half of the 1990s -- bank mergers involved about 20% of industry assets **each year**, and the holding companies that acquired other banks constituted about another 20% of the industry in each of these years. This consolidation wave has contributed to a dramatic increase in the average size of banking institutions. The mean size of banks in the U.S. has grown by 88.3% in real terms from the beginning of the 1980s to the end of 1995, while the mean size of complete banking organizations -- the banking assets of independent banks or top-tier bank holding companies (i.e., holding companies that are not owned by other holding companies) -- has grown by 112.0% over the same time period. Given the importance of the banking industry, it is not surprising that bank M&A activity has garnered much attention from researchers, policy analysts, and the press.

There are a number of potential benefits from the lifting of geographic barriers to competition in banking and the associated wave of M&A activity. These include, but are not limited to, increased geographic diversification, improved competition, and the elimination of entrenched inefficient or self-serving bank managers. What is less clear is the effect of consolidation on the supply of credit to U.S. businesses, particularly small businesses that depend on banks for external credit. According to a recent survey of small businesses, commercial banks are the single most important source of credit to small firms (Cole, Wolken, and Woodburn 1996). Prior research has established a fairly strong link between banking institution **size** and the supply of small business credit, with larger institutions devoting lesser proportions of their assets to small business lending than smaller institutions (e.g., see Berger, Kashyap, and Scalise 1995, Keeton 1995, Levonian and Soller 1995, Berger and Udell 1996, Peek and Rosengren 1996, Strahan and Weston 1996).

The relationship between bank size and the propensity to lend to small businesses is reflected in

Figure 1 using data for bank balance sheets as of June 1995. As banks get larger, the proportion of assets devoted to small business lending (i.e., domestic C&I loans to borrowers with bank credit less than $1 million) declines sharply from nearly 9% of gross total assets (GTA) for small banks to less than 2% for large banks. On the surface, this finding would seem to suggest that as banking assets are shifted on net from smaller to larger institutions through M&As, the overall supply of bank credit to small businesses may fall substantially. As an extreme upper bound, if the industry were so consolidated that all bank assets were in institutions with assets exceeding $10 billion **and** if the propensities to lend to small business were to remain constant, small business lending would fall by more than half from $160.4 billion to $79.1 billion (all financial values in real 1994 dollars).

However, this simplistic analysis assumes that lending propensities are static and are determined solely by size of bank. It neglects the fundamental nature of M&As as dynamic events that may involve significant changes in organizational behavior beyond the simple static aggregation of the merging institutions. Such conclusions also ignore the reactions of other lenders in the same local markets that might pick up any profitable loans that are no longer supplied by the consolidated institutions, or may react with their own dynamic changes in behavior that either increase or decrease their supplies of small business loans.

In this research, we depart from most of the extant literature by examining the dynamic impact of M&As, rather than drawing conclusions from a static comparison. We also depart from the **entire** extant literature -- including the other dynamic studies of bank M&As on lending -- by modeling the net impact of an M&A on small business lending as a combination of a number of separate static and dynamic effects, and by measuring the effects of M&As on lending by other banks in the local market.

We measure four effects of M&As on small business lending. The **static effect** is the change in lending propensities which results from simply combining the balance sheets of the participating banks into a larger pro forma institution with combined characteristics. Much like our simple example above, it assumes that the consolidated institution will have the same lending propensities as other institutions of the same size and other characteristics. The remaining effects are dynamic, the next two of which take into account the fact that merging institutions may change their focus. The **restructuring effect** identifies

the change in lending that follows from decisions to restructure the institution in terms of its size, financial characteristics, and local market competitive position. For example, the consolidated institution may choose to divest some of the combined assets in order to reduce excess capacity in its market, and this reduction in size after the M&A may alter its propensity to make small business loans. The **direct effect** of M&As captures the change in lending propensities that are attributable to a direct change in lending focus above and beyond the changes associated with the changes in the size and other characteristics created by the static and restructuring effects. That is, the direct effect captures the difference in lending by the new ' restructured' institution from what another institution of the same size and other characteristics that has not undergone a recent M&A would be. Finally, the **external effect** captures the dynamic responses to M&As of other lenders in the same local markets who may either increase or decrease their small business lending. Importantly, the external effect incorporates the possibility that some loans that may have been dropped by the consolidating institutions can create valuable business opportunities for other nearby banks or nonbank lenders. Thus, even if institutions engaging in M&As reduce their small business lending substantially, the **total** supply of these loans in the local market need not decrease substantially because some or all of these loans could be picked up by nearby institutions.

The purpose of this paper is to shed some empirical light on these issues. We measure the static, restructuring, and direct effects of the great majority of U.S. bank M&As from the late 1970s to the early 1990s, a total of over 6,000 M&As involving over 10,000 banks (many banks are involved in more than one M&A and are counted multiple times).[1] We also measure the external effects of these M&As on the lending of **all** banks in their local markets, whether or not these banks were themselves involved in an M&A. Because a number of research and policy issues turn on the type of M&A, we allow for the possibility that these loan supply effects differ for bank mergers versus bank holding company (BHC) acquisitions, for ' mergers of equals' versus other M&As, for ' family mergers' of banks within holding companies, for out-of-state acquisitions, etc. We also examine whether the effects of M&As differ by the relative and absolute sizes of the participants. Importantly, our use of a data set with a relatively long

[1]Excluded were M&As involving failed banks, which likely have different effects from other M&As, and observations with incomplete data.

time series allows us to examine the effects of M&As three years afterward to allow enough time for most of the dynamic effects to occur.

Our results suggest that the static effect tends to substantially reduce small business lending, consistent with prior research. However, this effect is largely if not fully offset by some of our dynamic effects. For bank mergers, the restructuring and direct effects only slightly offset the static effect, but the external effect suggests a strong positive reaction by other banks in the same local markets. For BHC acquisitions, the direct and external effects are each strong enough to offset the static effect. These results strongly suggest that a dynamic approach is needed and that inclusion of external effects of M&As on the lending of other local banks may be particularly important. There are also important differences by type of M&A and by size of participant.

The remainder of the paper is organized as follows. Section II reviews the literature. Section III describes and motivates each of the effects of M&As on the supply of small business lending, and Section IV formally defines and econometrically models these effects. Section V presents our empirical analysis of the data on U.S. bank M&As from the late 1970s through the first part of the 1990s. Section VI concludes.

II. Review of the Literature

The bank M&A literature has covered at least five main topics, including 1) event studies of the ex ante evaluation of the M&As by capital market participants (e.g., Houston and Ryngaert 1994, Palia 1994); 2) the relationship of these returns to ex post measures of performance (e.g., Cornett and Tehranian 1992, Pilloff 1996); 3) the determinants of the premium paid for the target (e.g., Palia 1993); 4) the cost and profit efficiency consequences of M&As (e.g., Berger and Humphrey 1992, Akhavein, Berger, and Humphrey 1997); and 5) the topic of this paper -- the effects of bank M&As on the supply of credit to small business borrowers -- which has only been studied quite recently despite its important policy and research implications.

Theory suggests that the larger, more organizationally complex institutions that are created by M&As may be less inclined than smaller, less complex institutions to lend to small, informationally opaque borrowers -- the borrowers who are most dependent on banks for credit and for whom the bank-

borrower relationship is most important. Large institutions may be less inclined to extend loans that demand intimate knowledge of the small business, its owner, and its local market because of Williamson (1967,1988) type organizational diseconomies associated with producing such loans along with other financial service products. These diseconomies might arise because lending to small, informationally opaque borrowers and lending to large, informationally transparent borrowers may be distinctly different activities that require the use of different technologies and entirely different credit cultures. That is, the policies and procedures associated with screening and monitoring small, informationally opaque borrowers and transmitting the relevant information within the banking institution may be very different from those associated with providing transaction-driven loans to large, informationally transparent borrowers.[2] In addition to a financial institution's size, its organizational complexity may also affect its small business lending. Greater organizational complexity -- such as having multiple layers of management or operating in multiple states -- may also make it more difficult to provide locally-based small business services in nationally- or internationally-oriented institutions. Together, these arguments suggest that large, complex banking institutions -- whose core business is the provision of capital market financial services -- may have difficulty competing against small, less complex banking institutions in the provision of the latter group's core business product -- loans to small, informationally opaque borrowers.[3]

Other factors beyond institution size and organizational complexity -- such as changes in market competitiveness or changes in the degree of ownership control -- theoretically may affect small business lending either positively or negatively. For example, prior to M&As, some banks may have made non-value maximizing choices with respect to small business lending because of a lack of competitive pressure to optimize and/or agency problems in which owners had difficulty controlling inefficient or self-serving managers. These difficulties may be more severe in banking than in other industries because geographic

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[2]See Ang (1992), Petersen and Rajan (1994,1995), Berger and Udell (1995), Houston and James (1995), and Blackwell and Winters (1997) for more evidence regarding relationship lending to small business.

[3]Consistent with these arguments, the corporate finance literature has found that large conglomerate nonfinancial firms often engage in asset sales which allow the firms to focus better on their core businesses or specialize in fewer product areas. Such improvements in focus tend to be associated with better operating performance over the three years following the asset sales as well as improvements in stock returns (see John and Ofek 1995).

restrictions on intrastate and interstate banking and other regulatory restrictions may have resulted in deviations from value maximization. Bank M&As that occur in reaction to the lifting of some of these restrictions may improve value maximizing behavior and economic efficiency. This may reduce small business lending to the extent that some negative net present value loans that were formerly made are not reissued, or may increase small business lending to the extent that some positive net present value loans that were formerly neglected are issued.[4]

The relatively recent empirical research on the effects of bank M&As on small business lending has employed two main data sources. The Federal Reserve's Survey of the Terms of Bank Lending to Businesses (STBL) contains detailed contract information on a sample of loans made by about 300 banks per quarter since the late 1970s, and includes virtually all large banks. The second source is a new section on the June Call Reports on quantities of lending to small borrowers that began in June 1993, so very few time periods are available. Both data sources have sufficient information to estimate the proportions of loans to small business borrowers, defined here and in other studies as borrowers with bank credit of less than $1 million. The STBL has the advantage of covering many more years of data, but it includes only some of the banks. The small business lending section of the Call Report has the advantage of including all the banks, but it is available for only a few years, which may make it difficult to use for studying the dynamic effects of M&As. Despite the differences, however, the two data sources virtually always yield the same qualitative conclusions.

Some of the literature has focused on the association between small business lending and banking institution size and organizational complexity. Berger, Kashyap, and Scalise (1995) and Berger and Udell (1996) using the STBL data, and Keeton (1995), Levonian and Soller (1995), Berger and Udell (1996), Peek and Rosengren (1996), and Strahan and Weston (1996) using the recent June Call Reports all found that small banking institutions tend to invest much higher proportions of their assets in small business

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[4]It is alternatively possible that increases in competitiveness may eliminate some positive net present value small business loans to relationship borrowers because more competition makes it more difficult to enforce long-term implicit contracts in which the borrower receives a subsidized interest rate in the short term and then compensates the bank by paying a higher rate in a later period (see Petersen and Rajan 1995).

loans than large institutions. In contrast to the unanimity of the effects of institution size, the empirical evidence on the effects of organizational complexity on the supply of small business credit are more mixed.[5] Some studies have concentrated on the liberalization of state geographic banking restrictions, which allows banking institutions to increase in both size and organizational complexity. Berger, Kashyap, and Scalise (1995), using the STBL, found evidence that past relaxation of geographic restrictions has been associated with a reduction in the supply of bank loans to small businesses.[6]

More in line with the analysis in this paper, several studies have pursued a dynamic approach by comparing lending before and after M&As. Peek and Rosengren (1996,1997), Strahan and Weston (1996,1997), and Craig and Santos (1997) used the recent June Call Report information on small business lending. Peek and Rosengren and Strahan and Weston generally found that M&As involving small banking institutions **increased** small business lending. However, their findings differed with regard to the effects of M&As between large institutions. Peek and Rosengren found decreases in small business lending associated with these M&As, whereas Strahan and Weston found no clear effect. Craig and Santos (1997) generally found no clear effect of M&As of either type, with the results depending crucially on the econometric method employed. Keeton (1996,1997) did not use the new small business lending section of the Call Report, but was generally able to isolate small business lending by looking at small banks, which typically cannot make anything but small loans because of legal lending limits and problems of diversification. Keeton found that certain types of acquisitions, particularly purchases by out-of-state institutions, were associated with a reduction in small business lending, generally consistent with Peek and

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[5]Berger and Udell (1996) found no clear effect of complexity on small business lending using the STBL data. Keeton (1995) analyzed the June 1994 Call Report data on small business lending in the 10th Federal Reserve District and found that banks owned by out-of-state BHCs and with other dimensions of complexity tended to invest smaller proportions of their funds in loans to small business borrowers. In contrast, Whalen (1995) used the June 1993 Call Report information for three states (Illinois, Kentucky, and Montana) and found that banks owned by out-of-state BHCs had equal or greater supply of small business lending than other banks.

[6]Other studies have found that geographic liberalization has been associated with an increase in average quality of bank loans (Jayaratne and Strahan 1996a) and an increase in bank profitability (Schranz 1993, Jayaratne and Strahan 1996b) -- suggestive of a relative shift in the supply of small business lending away from lower quality (and possibly more informationally opaque relationship borrowers) to higher quality loans.

Rosengren's results for M&As involving large institutions.

Thus, this recent literature as a whole gives a very mixed picture of the effects of bank M&As on the supply of small business credit, depending upon whether a static versus dynamic approach is pursued, the type of econometric procedure employed, whether bank mergers versus BHC acquisitions are analyzed, whether the consolidating institutions are small versus large, and whether they are in the same versus different states. This literature also does not reveal **how** M&As change the supply of credit -- i.e., the extent to which various static and dynamic effects may interact to reach a new equilibrium. Importantly, this literature as well leaves completely unknown whether any reduction in supply of small business credit by consolidating institutions may be offset by the reactions of other lenders in the same local market that might pick up profitable loans dropped by M&A participants.

In our analysis, we extend the dynamic approach to answer these difficult questions. We use a structural model to decompose the effects of M&As on small business lending into several static and dynamic effects to improve accuracy and to identify how M&As affect the credit supply process. We are also the first to examine the impact of M&As on lending by other banks in the same local market in order to estimate the **total** effect of bank M&As on the supply of credit to small businesses. In addition, we distinguish between the effects of bank mergers and BHC acquisitions, as well as among several types of each, to account for the possibility that different categories of M&As may have very different effects on the supply of small business credit. Finally, our use of the long data series from the STBL allows us to analyze a much greater number of M&A observations than prior studies that used the small business lending section of the Call Report, and allows for a fuller treatment of the dynamic effects of M&As by using data from a three-year gestation period following the M&As.

III. The Four Effects of M&As on Bank Lending

Our analysis suggests that the impact of M&As on bank lending behavior is quite complex, with one static effect and at least three types of dynamic effects. Disentangling these four effects allows us to identify more precisely than the extant literature **how** M&As affect small business lending. The **static effect** is simply the result from the banking institutions combining their pre-M&A assets into a larger institution with a combined balance sheet and competitive position. The static effect might be expected

to result in a decreased supply of small business loans, since (as discussed above) larger banking institutions tend to make fewer small business loans per dollar of assets. For example, if a bank with $600 million in assets merges with a $400 million bank, the static effect on small business lending captures the predicted difference in lending between a typical $1 billion bank and the two smaller banks. The $1 billion bank that results from simply adding together the pre-M&A balance sheets of the merging parties is referred to as the pro forma bank. The static effect also incorporates any impact from combining the financial conditions or other exogenous variables of the two smaller institutions.

The **restructuring effect** is a dynamic effect of the M&A due to a change in focus in which the institution changes its size, financial condition, or competitive position from their pro forma values after consummating an M&A. In our simple example, the merger of the $600 million bank and the $400 million bank might eventually result in a consolidated bank of only $800 million after the merger, rather than $1 billion. This could occur, for example, if the purpose of the merger was to reduce excess banking capacity in the local market. This reduction in bank size from the $1 billion pro forma bank to the $800 million actual bank would likely increase its proportion of assets devoted to small business lending since smaller institutions tend to have higher proportions of these loans.

The consolidated institution's new focus may also be associated with changes in portfolio composition and financial ratios after consolidation because of the inherent diversification benefits of the M&A, the implementation of new risk-management techniques, changes in operating efficiency, or changes in risk preferences. The change in focus of the consolidated institution may also affect its local market competitive position if, for example, the consolidated institution chooses to shrink after the M&A and have a smaller market share. Thus, the new institution may restructure itself over time in ways that alter its size, financial condition, or local market competitive position. In turn, these post-consolidation changes may affect the institution's propensity to make small business loans.

In some cases, the restructuring might occur not by choice, but rather because antitrust authorities require divestiture of some banking operations in overlapping local markets pursuant to an M&A to keep market concentration from rising excessively. The deposits in some branches and the loans associated with these deposits or branches are sold to another bank as a condition for M&A approval, although

required divestitures are relatively rare and they typically involve only a small percentage of the pro forma institution's assets or deposits when they do occur. To illustrate, over the decade 1982-91 (which covers most of our sample period), divestitures were required in only 35 of 4,515 M&A approvals, or about 0.78% of all M&A approvals.[7] Within these 35 required divestitures, a weighted average of only 1.59% of the deposits of the pro forma institution were divested.

The third potentially important factor affecting the merged or acquired bank's supply of business lending is the **direct effect**. This is the change in lending attributable to a direct refocussing of attention toward or away from small business lending, net of any of the static and restructuring effects already discussed. That is, the direct effect of an M&A is the difference between a bank's lending after consolidation and the lending of another institution of the same size, financial condition, local market competitive position, and economic environment as the restructured bank that has not undergone an M&A. In terms of our simple example in which the $600 million and $400 million banks merge and become an $800 million bank after restructuring, the direct effect is how the bank's lending differs from another $800 million bank that is the same in every respect as the restructured bank except that it did not engage in a recent M&A.

One type of direct effect would occur if the institution changes its lending policies and procedures, perhaps to bring the acquired part of the institution into accord with the acquirer's lending focus on either small or large borrowers. Consolidated institutions could also choose to become more or less aggressive in reissuing loans to past customers than other institutions, all else equal, because of the management's philosophy for improving the institution. The institutions that survive mergers may also be more efficient or better diversified than other institutions, and therefore be better equipped to issue more loans.[8]

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[7]The number of M&A approvals reported here differs from the number of M&As reported in Table 1 and used elsewhere in the paper. This is because an M&A approval often involves a consolidation of holding companies involving many banks. In our empirical analysis, we count each bank that is acquired as a separate acquisition, because we examine lending at the level of the individual bank.

[8]Empirical studies generally do **not** find that M&As improve cost efficiency (e.g., Berger and Humphrey 1992). However, there is evidence that M&As improve profit efficiency and other measures of performance through enhanced loan diversification (Hawawini and Swary 1990, Benston, Hunter, and Wall 1995, Hughes, Lang, Mester, and Moon 1996, Akhavein, Berger, and Humphrey 1997, Demsetz and Strahan 1997).

It may be argued that the restructuring and direct effects of M&As on lending are not necessarily independent, but rather may be part of the same dynamic refocusing of the consolidated institution. That is, the decision to change institution size, financial condition, and competitive position and the decision to lend to small businesses at a different rate than other institutions of the same characteristics as the restructured institution may be part of the same managerial plan. For example, an institution may restructure to grow larger after a merger because it wishes to switch into larger loans that only more sizable institutions can issue. Nonetheless, we estimate these effects separately, primarily because the evidence cited above suggests that banking institution size is very important in determining the propensity to make small business loans. In estimation, we control for institution size to allow it to have an effect on lending that is independent of the direct effect of M&As, which in turn necessitates estimating a separate restructuring effect of M&As that operates through size and similar factors. In any event, the total effect on the lending of consolidating banks from their dynamic refocusing may be determined simply as the sum of the restructuring and direct effects.

The final dynamic effect of M&As, the **external effect**, captures the reactions by other lenders in the local market to the change in competitive conditions created by the M&A. For example, if a consolidated institution reduces its small business lending, this may create opportunities for other local banks to pick up loans with positive net present values.[9] In some cases, loan officers that leave the consolidated institution may start a de novo bank or join other local competitors and keep their connections with small relationship borrowers. Consistent with the possibility, Goldberg and White (1997) found that de novo banks tend to lend more to small businesses as a percentage of assets than other small banks of comparable size. Importantly, the external effect does not necessarily act as a partial offset to the change in lending by the consolidating banks. The external effect could more than offset the change in lending by consolidating banks or could even move in the same direction as these other effects. For example, if some types of M&As increase the supply of small business loans because a more aggressive

[9]Hancock and Wilcox (1994) found another type of external effect, although they did not examine M&As or small business lending in particular. They found that when banks reduced their consumer, C&I, and real estate loans in response to performance problems, other banks in the same state or region generally reacted by increasing their holdings of the corresponding loan categories.

competitor has entered the market, other local banks or nonbank lenders could respond by also increasing their supplies. For estimating the **total** supply of small business lending, it is just as important to consider this external effect as it is to consider the static, restructuring, and direct effects on the loan supply of the consolidating institutions.

In our empirical analysis below, we measure the effects of M&As on small business lending by banks in the same local market. Although we exclude nonbank lenders and banks in other local markets from the external effect (because of data and computational limitations), prior analysis found that 84.9% of small businesses use the services of a commercial bank within 30 miles (Kwast, Starr-McCluer, and Wolken 1997, Table 1), which suggests that we are likely to capture most of any M&A external effect with our measure.

The measurement of the four effects of M&As on small business lending requires consideration of the time dimension of the effects. The static effect ends at the time of the M&A with the combination of the participants into the pro forma institution. By contrast, the dynamic restructuring, direct, and external effects begin after the M&A and may take several years to complete. For example, it may take time to restructure the consolidated institution's portfolio by divesting assets, or to change its lending focus by promulgating revised lending policies and procedures. There may also be temporary disequilibrium due to downsizing, meshing of corporate cultures, or turf battles that draw managerial attention away from the refocusing efforts. Bank managers and consultants often mention three years as the gestation period needed to restructure the institution and change its focus after an M&A. Some find performance changes as much as five years after M&As (e.g., Toevs 1992). Research efforts at measuring other performance effects of bank M&As also have often used a three-year interval (e.g., Cornett and Tehranian 1992). The external effect on other banks in the local market is likely to take at least as long as the effects on the institutions involved in the M&As, so at least three years may be appropriate for measuring the external effect.[10]

The empirical literature discussed above that uses the small business lending section of the Call

[10]For example, the press reports that it often takes one to three years after an M&A for the departing loan officers to start a rival de novo bank (e.g., Epstein 1996).

Report has generally been limited to only one or two years after the M&As because these data have only recently been collected (since June 1993). It seems likely that these studies may have missed some of the dynamic effects that may take longer to complete. In this study, we use the longer time series available from the STBL data to estimate the three types of dynamic effects over a three year horizon. For comparison purposes, we also estimate the dynamic effects for a single year after an M&A.

IV. An Econometric Model of Lending and the Potential Effects of M&As

In this section, we present our econometric framework for analyzing the sources of change in loan supply associated with M&As. We refer to a union in which two or more banks with separate charters were consolidated under a single bank charter as a ' merger,' and denote the remaining bank as a ' survivor' and the bank or banks whose charter(s) disappeared as ' targets.' We refer to a union in which a bank retained its charter, but obtained a different top-tier holding company as an ' acquisition,' the surviving top-tier BHC as the ' acquirer', and the banks that were directly purchased or were in holding companies that were purchased as the ' acquired.'[11] Whether lending is affected more by mergers or acquisitions depends in large part upon whether effective control of lending decisions most often resides at the bank or holding company level.

The lending equations specify the proportions of a bank's gross total assets (GTA) that are allocated to domestic commercial and industrial (C&I) loans to different borrower size categories.[12] Following prior research, we proxy for the size of the borrower by the maximum of 1) the size of the loan from the bank, 2) the total commitment under which the loan was drawn from the bank (if any), and 3) the total size of the participation by all banks in a loan participation (if any). This measure is an estimate of the total bank credit available to the borrower. Also consistent with prior research, we define ' small' business borrowers as those with bank credit below $1 million, ' medium-sized' borrowers as those with credit between $1 million and $25 million, ' large' borrowers as those with access to more than $25

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[11]Some mixed cases are counted as mergers. For example, if Bank A owned by holding company X merges with independent Bank B and only Bank A's charter survives, this is counted as a merger, rather than an acquisition, since the acquired bank's charter did not survive.

[12]Gross total assets include loan loss reserves. We analyze lending in terms of GTA rather than (net) total assets because the value of loans is inclusive of loan loss reserves and because GTA is a superior measure of the size of the bank.

million in bank credit.

The equations are specified in log-odds logit form, so that the dependent variables are $\ln(P_i/(1-P_i))$, i=1,2,3, where ln indicates natural log, P_i is the proportion of the bank's GTA invested in loans to domestic borrowers in credit category i (i=1 indicates ' small' borrowers, and so forth). That is, we think of the banking institution as choosing how to allocate its assets among loans to three categories of domestic C&I borrowers and to other assets. The log-odds ratios are specified as functions of the size, financial condition, and competitive position of both the bank and its total organization (including assets of other banks held by the top-tier BHC if any), variables indicating recent past M&A activity, and other variables describing the bank and its environment that might affect lending decisions. The main equations of the model are of the form:

$$\begin{aligned}\ln(P_{it}/(1-P_{it})) = f_i\,(&\text{BANK AND ORG SIZE}_{t-1},\ \text{BANK AND ORG FINANCIAL}_{t-1},\\ &\text{BANK AND ORG COMP POSITION}_{t-1},\ \text{ORG COMPLEXITY}_{t-1},\\ &\text{PAST M\&A}_{t-1,t-2,t-3},\ \text{MARKET PAST M\&A}_{t-1,t-2,t-3},\ \text{TIME}_{t-1},\\ &\text{ENVIRONMENT}_{t-1}) + \epsilon_{it}, \qquad i=1,2,3.\end{aligned} \tag{1}$$

The definitions and sample means of all the variables in equation (1) are given in Table 2. The data are annual and all of the right-hand-side variables are lagged at least one year relative to the lending proportions on the left-hand-side, eliminating endogenous feedback effects. Thus, lending decisions in one year are functions of the bank and organization size, financial condition, M&A activity, etc. in the previous year or years. All of the right-hand side variables except for the M&A variables are stock figures as of year-end t-1, which occur before the lending on the left-hand side, which is a flow that occurs throughout year t.

Equations (1) are estimated for all banks in the STBL, which contains data on the characteristics of individual loans that allow us to categorize whether the borrower is small, medium, or large.[13] In our estimation of the effects of M&As below, we use predicted values from this equation for essentially **all** banks involved in M&As, since the right-hand-side variables are observable for all commercial banks over

[13]An exception is that we do not include observations if an M&A occurs in year t because some of the lending in year t would be made by consolidated and unconsolidated firms. The lending by these banks is then re-included in year t+1 if no M&A occurs in that year.

time from the main body of the Call Report and other regulatory reports.

The BANK SIZE variables include first- and second-order terms in the log of gross total assets, LNGTA and ½LNGTA^2, as well as dummies for bank size class measured in real 1994 dollars. The size classes are SMALLBANK (GTA < $100 million), MEDBANK ($100 million - $1 billion), LARGEBANK ($1 billion - $10 billion), and HUGEBANK (≥ $10 billion). The dummy for the smallest size class is excluded from the regression specification as the base case. The inclusion of bank size as a continuous variable and as size class dummies allows for both small effects and large changes at the size class level.

The ORG SIZE variables replicate the BANK SIZE variables, except that they are based on ORGGTA, which includes all the banking assets in the organization. For banks in BHCs, ORG SIZE is based on all the assets in the banks directly controlled by the top-tier holding company or indirectly controlled through the ownership of lower-tier BHCs. For independent banks or banks in one-bank holding companies, ORG SIZE and BANK SIZE are identical. The inclusion of ORG SIZE allows for the possibility that at least partial control of lending procedures is exercised at the centralized level of the organization.

The BANK AND ORG FINANCIAL variables measure the equity position and condition of the loan portfolio at the bank and organization levels. These variables include the equity/GTA ratio, loan loss reserves/total loans, other real estate owned/total loans, nonperforming loans/total loans, and second-order terms in these ratios (i.e., ½X^2) to allow for nonlinearities. Banks with higher capital ratios and lower problem loan ratios should have a greater supply of credit, all else equal, because of fewer market and regulatory constraints.

The COMP POSITION variables control for the competitive conditions in the local banking markets in which the institution competes. The Herfindahl index and market shares of the bank and organization are measured as weighted averages over all the local markets in which the institution has offices with deposits.[14]

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[14]Each local market is defined as a Metropolitan Statistical Area (MSA) or non-MSA county. The market structure variables are based on the distribution of deposits from the June Summary of Deposits data. When there was an M&A between June and December, the COMP POSITION variables were recomputed moving the branches to the surviving bank or acquiring holding company.

The ORG COMPLEXITY variables control for the managerial structure of the organization, allowing for the possibility that organizational complexity may affect small business lending. We measure whether the bank is owned by a BHC, whether there are multiple layers of BHC over the bank, and whether the bank's top-tier BHC is registered with the SEC for public trading, thus adding public shareholders as an additional layer potentially governing the behavior of the bank. We also include OUT-OF-STATE, an indicator of whether the bank's top-tier BHC is located in another state. This allows for the possibility that interstate ownership makes it more difficult to make small relationship loans or makes it easier to issue some larger business loans.

The PAST M&A variables account for the presence of M&A activity in the past three years, and are used for measuring the dynamic direct effect of M&As discussed above. We measure the effects of several different types of M&As because they may have different potential impacts on small business lending policy and procedures. The variables MERGEDk, k=1,2,3 indicate that the bank is a survivor of one or more bank mergers k years ago. The variables MERGEDk-EQ designate whether these were ' mergers of equals,' defined here as when the surviving bank (whose charter is retained) had between 1/3 and 2/3 of the pro forma bank's GTA before the merger. The variables MERGEDk-FAM denote whether the MERGEDk were ' family mergers' of banks that were already in the same top-tier BHC. The ACQUIREDk, k=1,2,3 variables indicate that the bank was acquired k years ago, i.e., switched to the control of a different top-tier BHC. Similarly, ACQUIREDk-EQ shows whether the change in control was an ' acquisition of equals' in which the acquiring BHC's GTA before merger was between 1/3 and 2/3 of pro forma holding company's GTA. The variables ACQUIREDk-OUT designate that the bank was purchased by an out-of-state BHC. These variables should be distinguished from the OUT-OF-STATE variable above, which measured the steady-state effect of interstate ownership.[15] Finally, the PURCHk, k=1,2,3 denote that the bank's top-tier BHC purchased other banks in the past three years to incorporate the effects of any drain of managerial attention from the existing affiliates.

The MARKET PAST M&A variables are the weighted averages of the PAST M&A variables of all the banks and BHCs in the same local markets (MSA or non-MSA county). For example, MAR-

[15]The interstate acquisitions have no analogy at the bank level because interstate branching was prohibited over the sample interval.

MERGEDk measures the weighted average proportion of deposits in the bank's local market that were in banks that survived mergers k years ago. These variables are used to measure the external effect discussed above -- the effect of M&As on lending by other banks in the same local market.

The PAST M&A variables and the MARKET PAST M&A variables are both also interacted with the BANK SIZE and ORG SIZE variables. Specifically, we interact all past bank merger variables with the log of bank size LNTA, and interact all past acquisition variables with the log of BHC size LNORGTA. These variables allow the effects of M&As to depend on the size of the institution.

The remaining variables control for differences in the time period and economic environment of the bank. The TIME dummies for every year control for changes in macroeconomic conditions, regulations, and technology over time. The ENVIRONMENT variables include dummies for every state (except the base case of California) to control for differences in demand and supply conditions and state banking regulations. We also specify dummies for the bank's primary federal regulator, FED, FDIC, OCC to control for differences in regulatory treatment (OCC excluded as the base case). Finally, we include INMSA, a dummy for whether the bank is headquartered in an MSA, since metropolitan and rural markets differ so greatly.

Measurement of the Static Effect

To measure the **static effect**, we simply take the lending predicted by equation (1) for the pro forma bank less the lending predicted by equation (1) for the pre-M&A banks. This gives the effects of increasing the size of the institution (bank, organization, or both), any change in organizational complexity, local market share, or concentration, and any effects of combining the financial ratios and other conditioning variables of the consolidating parties. The balance sheet and other right-hand-side variables are formed as of year-end t-1, which predicts what lending would have been in year t.

We illustrate with our simple example of the $600 million and $400 million banks merging, which we refer to as Banks A and B, respectively. We assume that neither bank is in a BHC, so that organization size equals bank size here. The pro forma bank has GTA of $1 billion as of year-end t-1, and the proportion of assets predicted to be invested in loans to borrower size category i during year t, P_{it}^{PF}, is given by:

$$\ln(P_{it}^{PF}/(1-P_{it}^{PF})) = \hat{f}_i\,(\text{BANK AND ORG SIZE}_{t-1}^{PF},\ \text{BANK AND ORG FINANCIAL}_{t-1}^{PF},\ \text{BANK AND ORG COMP POSITION}_{t-1}^{PF},\ \text{ORG COMPLEXITY}_{t-1}^{PF},\ \text{PAST M\&A}_{t-1,t-2,t-3}^{PF},\ \text{MARKET PAST M\&A}_{t-1,t-2,t-3}^{PF},\ \text{TIME}_{t-1},\ \text{ENVIRONMENT}_{t-1}^{PF}) \quad i=1,2,3, \tag{2}$$

where $\hat{f}$ indicates that these are predicted values using the estimated parameters from equation (1). The PF superscripts on the right-hand-side variables denote the initial conditions under which the pro forma bank would operate -- bank and organization size of $1 billion; financial ratios, past M&A and market M&A activity numbers that are weighted averages of the year-end t-1 figures for A (weight = .6) and B (weight =.4); and competitive position, organizational complexity, and environmental variables that depict the consolidated institution.

Again using the estimated parameters from equation (1), the predicted value of proportion of GTA that Bank A would lend to borrower category i during year t if it had not been merged is given by:

$$\ln(P_{it}^{A}/(1-P_{it}^{A})) = \hat{f}_i\,(\text{BANK AND ORG SIZE}_{t-1}^{A},\ \text{BANK AND ORG FINANCIAL}_{t-1}^{A},\ \text{BANK AND ORG COMP POSITION}_{t-1}^{A},\ \text{ORG COMPLEXITY}_{t-1}^{A},\ \text{PAST M\&A}_{t-1,t-2,t-3}^{A},\ \text{MARKET PAST M\&A}_{t-1,t-2,t-3}^{A},\ \text{TIME}_{t-1},\ \text{ENVIRONMENT}_{t-1}^{A}) \quad i=1,2,3. \tag{3}$$

The predicted proportions for Bank B follow analogously. The estimated static effect on the proportion of GTA lent to borrowers in category i is given by:

$$\text{Static Effect} = P_{it}^{PF} - .6 \bullet P_{it}^{A} - .4 \bullet P_{it}^{B} \qquad i=1,2,3. \tag{4}$$

Measurement of the Restructuring Effect

The restructuring effect measures the change in lending associated with the changes in the pro forma institution's size, financial condition, and competitive position that occur **after** consummating an M&A. This is somewhat complicated by the secular change in these variables over time due to changes in macroeconomic conditions, regulations, and technology. We estimate both secular change and the restructuring effect using essentially the same two-step procedure. We estimate the changes in size, condition, and competitive position that are expected to occur over time after the M&A, and then we plug these changes into equation (1) to obtain the predicted effects of these changes on bank lending.

To estimate the expected changes over time in banking institution size, financial condition, and

competitive position, we estimate regression equations with the changes in these factors as the dependent variables. We illustrate this procedure for the change in the log of bank GTA over the j years after t-1. The regression for the change in LNGTA from period t-1 to t+j-1, $j \geq 1$, is given by:

$$\begin{aligned} \Delta LNGTA_{t+j-1} = \; & g^j (\text{BANK AND ORG SIZE}_{t-1}, \text{BANK AND ORG FINANCIAL}_{t-1}, \\ & \text{BANK AND ORG COMP POSITION}_{t-1}, \text{ORG COMPLEXITY}_{t-1}, \\ & \text{PAST M\&A}_{t-1,t-2,t-3}, \text{MARKET PAST M\&A}_{t-1,t-2,t-3}, \text{TIME}_{t-1}, \\ & \text{ENVIRONMENT}_{t-1}, \text{CURRENT M\&A}_t, \\ & \text{MARKET CURRENT M\&A}_t) + \eta^j_{t+j-1}, \qquad j \geq 1, \end{aligned} \tag{5}$$

where $\Delta LNGTA_{t+j-1} \equiv LNGTA_{t+j-1} - LNGTA_{t-1}$. Similar equations are run for changes in the LNORGTA,

BANK AND ORG FINANCIAL, and COMP POSITION variables. The right-hand-side of these equations includes all the variables from equation (1) plus variables for CURRENT M&A and MARKET CURRENT M&A for year t. These M&A variables do not create a problem of endogeneity, since the current M&As occur during year t and the dependent variables are measured at the end of year t or later.

Equations (5) are estimated for virtually all observations using Call Report data, since data on loan size, etc. from the STBL are not needed. For banks involved in M&As, the data on the right-hand-side of (5) and the $LNGTA_{t-1}$ on the left-hand-side use the pro forma bank, so that we may measure the changes in size, condition, and competitive position relative to the pro forma bank. As discussed above, our main estimates of the dynamic effects of mergers allow for three years of changes after the M&A, so we will set j=3 and estimate the changes in lending in year t+3. Since the size, condition, and competitive position variables are all lagged one year in the lending equation (1), we estimate in equation (5) the three-year changes in these variables from year t-1 to year t+2. Since we also estimate the dynamic effects one year after M&A for comparison, we also set j=1 and estimate equation (5) for the change in variables from t-1 to t.

The secular change in LNGTA for banks involved in M&As are measured by the predicted values of (5), setting all the t-1 values and the PAST M&A values to those of pro forma bank, and setting the CURRENT M&A values to zero (as if the bank was not in a current M&A):

$$\Delta LNGTA^{SEC}_{t+j-1} = \hat{g}^j (\text{BANK AND ORG SIZE}^{PF}_{t-1}, \text{BANK AND ORG FINANCIAL}^{PF}_{t-1},$$

$$\begin{aligned} &\text{BANK AND ORG COMP POSITION}_{t-1}^{PF}, \text{ ORG COMPLEXITY}_{t-1}^{PF}, \\ &\text{PAST M\&A}_{t-1,t-2,t-3}^{PF}, \text{ MARKET PAST M\&A}_{t-1,t-2,t-3}^{PF}, \text{ TIME}_{t-1}, \\ &\text{ENVIRONMENT}_{t-1}^{PF}, \underline{0}, \\ &\text{MARKET CURRENT M\&A}_t), \qquad j \geq 1, \end{aligned} \tag{6}$$

where $\underline{0}$ denotes a vector of zeros for the CURRENT M&A vector. Thus, $\Delta LNGTA_{t+j-1}^{SEC}$ reflects how the pro forma bank's LNGTA would be expected to evolve from period t-1 to t+j-1, leaving out any effects of the current M&A other than the static effect that created the pro forma bank. Equations (6) are repeated for the organization size, and the bank and organization financial and competitive position variables.

The predicted lending proportions inclusive of secular change as well as the static effect are given by plugging these predicted changes in size, condition, and competitive position into the estimates of equation (1). That is, we add to the pro forma bank the predicted changes in size, condition, and structure and measure the predicted lending in period t+j:

$$\begin{aligned} \ln(P_{it+j}^{SEC}/(1-P_{it+j}^{SEC})) = \hat{f}_i \,(&\text{BANK AND ORG SIZE}_{t-1}^{PF} + \Delta\text{BANK AND ORG SIZE}_{t+j-1}^{SEC}, \\ &\text{BANK AND ORG FINANCIAL}_{t-1}^{PF} + \Delta\text{BANK AND ORG FINANCIAL}_{t+j-1}^{SEC}, \\ &\text{BANK AND ORG COMP POSITION}_{t-1}^{PF} \\ &+ \Delta\text{BANK AND ORG COMP POSITION}_{t+j-1}^{SEC}, \\ &\text{ORG COMPLEXITY}_{t-1}^{PF}, \text{ PAST M\&A}_{t+j-1,t+j-2,t+j-3}^{PF} \\ &\text{MARKET PAST M\&A}_{t+j-1,t+j-2,t+j-3}^{PF}, \text{ TIME}_{t+j-1}, \\ &\text{ENVIRONMENT}_{t+j-1}^{PF}), \qquad i=1,2,3; \;\; j \geq 1.^{16} \end{aligned} \tag{7}$$

The estimated secular change in the proportion of GTA lent to borrowers in the ith category j years after the M&A is simply obtained by subtracting off the pro forma proportion, giving:

$$\text{Secular change} = P_{it+j}^{SEC} - P_{it}^{PF}, \qquad i=1,2,3; \; j \geq 1. \tag{8}$$

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[16]The PAST M&A and MARKET PAST M&A vectors in this equation have the PF script, indicating that these variables contain only the M&A information available as of the time of the pro forma bank, t-1. That is, the PAST $M\&A_{t+j-1,t+j-2,t+j-3}^{PF}$ simply updates the M&A history of the pro forma bank, moving any M&As that might have occurred prior to year t to later positions in the vector, excluding any M&As that might have occurred in t or thereafter. For example, when j=1 and lending is being predicted for period t+1, any M&A that occurred in period t-1 is treated as occurring 2 periods ago, and any M&A from t-2 as occurring 3 periods ago, but no M&As are registered as occurring 1 period ago.

To estimate the restructuring effect, we calculate the predicted changes in LNGTA and the other variables from equation (6) as above, except that the CURRENT M&A vector replaces the $\underline{0}$ vector. Thus,

$$\begin{aligned}\Delta LNGTA_{t+j-1}^{RES} = \hat{g}^{j} \,(&BANK\ AND\ ORG\ SIZE_{t-1}^{PF},\ BANK\ AND\ ORG\ FINANCIAL_{t-1}^{PF},\\ &BANK\ AND\ ORG\ COMP\ POSITION_{t-1}^{PF},\ ORG\ COMPLEXITY_{t-1}^{PF},\\ &PAST\ M\&A_{t-1,t-2,t-3}^{PF},\ MARKET\ PAST\ M\&A_{t-1,t-2,t-3}^{PF},\ TIME_{t-1},\\ &ENVIRONMENT_{t-1}^{PF},\ CURRENT\ M\&A_{t},\\ &MARKET\ CURRENT\ M\&A_{t}), \qquad j \geq 1.\end{aligned} \tag{9}$$

The predicted lending proportion P_{it+j}^{RES}, which now includes the restructuring effect, again uses the coefficients of the lending equation (1). It is the same as the predicted value from equation (7) except for the adjusted changes in size, condition, and competitive position that embody the effect of the current M&A:

$$\begin{aligned}\ln(P_{it+j}^{RES}/(1-P_{it+j}^{RES})) = \hat{f}_{i} \,(&BANK\ AND\ ORG\ SIZE_{t-1}^{PF} + \Delta BANK\ AND\ ORG\ SIZE_{t+j-1}^{RES},\\ &BANK\ AND\ ORG\ FINANCIAL_{t-1}^{PF}\\ &+ \Delta BANK\ AND\ ORG\ FINANCIAL_{t+j-1}^{RES},\\ &BANK\ AND\ ORG\ COMP\ POSITION_{t-1}^{PF}\\ &+ \Delta BANK\ AND\ ORG\ COMP\ POSITION_{t+j-1}^{RES},\\ &ORG\ COMPLEXITY_{t-1}^{PF},\ PAST\ M\&A_{t+j-1,t+j-2,t+j-3}^{PF}\\ &MARKET\ PAST\ M\&A_{t+j-1,t+j-2,t+j-3}^{PF},\ TIME_{t+j-1},\\ &ENVIRONMENT_{t+j-1}^{PF}), \qquad i=1,2,3;\ \ j \geq 1.\end{aligned} \tag{10}$$

Thus, the estimated restructuring effect on the proportions of GTA lent j years after the M&A is given by:

$$\text{Restructuring Effect} = P_{it+j}^{RES} - P_{it+j}^{SEC}, \qquad i=1,2,3;\ \ j \geq 1. \tag{11}$$

Measurement of the Direct Effect

The direct effect is the additional effect of M&As on lending after taking into account the changes in size, financial condition, and competitive position of the consolidating institutions. It is calculated from the parameters of equation (1), using as a starting point the simulated changes in the right-hand side variables from the static and restructuring effects and the secular change. Thus, the estimated proportion of GTA lent to borrowers in the ith category j years after the M&A inclusive of the direct effect and all of these other factors is given by:

$$\ln(P_{it+j}^{DIR}/(1-P_{it+j}^{DIR})) = \hat{f}_i\,(\text{BANK AND ORG SIZE}_{t-1}^{PF} + \Delta\text{BANK AND ORG SIZE}_{t+j-1}^{RES},$$
$$\text{BANK AND ORG FINANCIAL}_{t-1}^{PF}$$
$$+ \Delta\text{BANK AND ORG FINANCIAL}_{t+j-1}^{RES},$$
$$\text{BANK AND ORG COMP POSITION}_{t-1}^{PF}$$
$$+ \Delta\text{BANK AND ORG COMP POSITION}_{t+j-1}^{RES},$$
$$\text{ORG COMPLEXITY}_{t-1}^{PF}, \text{PAST M\&A}_{t+j-1,t+j-2,t+j-3}^{CUR} \qquad (12)$$
$$\text{MARKET PAST M\&A}_{t+j-1,t+j-2,t+j-3}^{PF}, \text{TIME}_{t+j-1},$$
$$\text{ENVIRONMENT}_{t+j-1}^{PF}), \qquad i=1,2,3;\ j\geq 1.$$

Equation (12) is identical to (10), except that $\text{PAST M\&A}_{t+j-1,t+j-2,t+j-3}^{CUR}$ replaces $\text{PAST M\&A}_{t+j-1,t+j-2,t+j-3}^{PF}$ to allow for the effects of M&As in period t. The CUR superscript designates that current M&As in period t are included, but M&As after period t are excluded, since they would confound the effects of period t M&As.

The estimated direct effect is obtained by subtracting out the other effects:

$$\text{Direct Effect} = P_{it+j}^{DIR} - P_{it+j}^{RES}, \qquad i=1,2,3;\ j\geq 1. \qquad (13)$$

Measurement of the External Effect

To measure the external effect, we use the MARKET PAST M&A variables, which to this point have been treated as control variables. For every bank, we measure the external effect as the impact on their lending of M&As in their local markets over the past 3 years. If there had been no M&As in their local markets, the predicted proportion lent to borrowers in size category i would be given by the predicted value from equation (1) with the MARKET PAST M&A variables set to zero:

$$\ln(P_{it}^{NOEXT}/(1-P_{it}^{NOEXT})) = \hat{f}_i\,(\text{BANK AND ORG SIZE}_{t-1}, \text{BANK AND ORG FINANCIAL}_{t-1},$$
$$\text{BANK AND ORG COMP POSITION}_{t-1}, \text{ORG COMPLEXITY}_{t-1},$$
$$\text{PAST M\&A}_{t-1,t-2,t-3}, \underline{0}, \text{TIME}_{t-1}, \qquad (14)$$
$$\text{ENVIRONMENT}_{t-1}^{PF}) \qquad i=1,2,3.$$

The external effect is incorporated by setting the MARKET PAST M&A variables to their actual values:

$$\ln(P_{it}^{EXT}/(1-P_{it}^{EXT})) = \hat{f}_i\,(\text{BANK AND ORG SIZE}_{t-1}, \text{BANK AND ORG FINANCIAL}_{t-1},$$
$$\text{BANK AND ORG COMP POSITION}_{t-1}, \text{ORG COMPLEXITY}_{t-1},$$
$$\text{PAST M\&A}_{t-1,t-2,t-3}, \text{MARKET PAST M\&A}_{t-1,t-2,t-3}, \text{TIME}_{t-1}, \qquad (15)$$
$$\text{ENVIRONMENT}_{t-1}^{PF}) \qquad i=1,2,3.$$

which is simply the predicted value of equation (1). The difference between these predictions is our estimate of the external effect on the proportion of GTA lent to borrowers in category i in period t:

$$\text{External Effect} = P_{it}^{EXT} - P_{it}^{NOEXT,} \qquad i=1,2,3. \tag{16}$$

The external effect is likely to be less accurately measured than the other effects, and so should be looked upon primarily as a qualitative measure to determine how other banks in the market tend to react to M&As. This is because it would be intractable to form a structural econometric model like that used to measure the static, restructuring, and direct effects. Such a model would require tracing the effect of each individual M&A to every one of the other banks in the local market, and then map out how each of these other banks might change their size, financial ratios, and competitive positions in response to each M&A event. Instead, we measure the simple reduced form response of every bank in the nation to the percentage of bank assets in its local market(s) that were involved in M&As, and recognize the limitations of this measure. It is useful for determining generally whether other local banks may pick up substantial proportions of small business loans that might be dropped by banks involved in M&As or otherwise react to local M&As, and whether these effects are large in magnitude, but should not be viewed as a precise measure of these reactions. Our measure also excludes the reactions of nonbanks and nonlocal lenders, but as noted above, these other sources are much less important than local banks in servicing small businesses.

V. Empirical Results

We estimated equations (1) -- which predict the proportions of assets invested in loans to domestic borrowers in different credit size categories -- using data on banks in the STBL sample over the period 1980-95. Recall that we are able to predict lending for all banks from this sample because all the regressors are available from the Call Report and other sources. These log-odds equations were estimated by weighted least squares in order to avoid heteroskedasticity problems, as in prior research (e.g., Berger and Udell 1996).[17] We estimated equations (5) by OLS for the one-year and three-year changes in the

[17]The underlying parameter estimates for equations (1) are shown in Appendix Table A1. The merger and acquisition variables (which are used to compute the direct effects) are generally statistically significant when evaluated in logical groupings. Specifically, F-tests of all PAST M&A variables and

bank and organization size, financial condition, and competitive position variables using all the banks over the periods such that t+j-1 was in 1979-94, the years just before lending is analyzed.

The Static, Restructuring, and Direct Effects

The top panel of Table 3 shows our analysis of the static, restructuring, and direct effects for mergers three years after the events, and the bottom panel gives the corresponding information for acquisitions. Although we believe that allowing three years for the dynamic effects to work is the best approach, we also show the corresponding results from a single year after M&A in Table 4. We show the effects of M&As on small, medium, and large business lending, i.e., to domestic business borrowers with bank credit below $1 million, $1 million to $25 million, and over $25 million. However, we will concentrate on the consequences for small business lending, where most of the important policy and research questions reside.

All of our results are for the effects of M&As on lending during the years 1980-95, i.e., period t+j after the M&A ranges from 1980-95. We set j=3 for the main results, so the M&As range from 1977-92, three years before the lending data. As shown in Table 3, we analyze mergers that combine 6,369 banks into 2,508 surviving banks. More than half of the bank charters disappear because there were multiple targets in the same year for some survivor banks. We also analyze 4,146 acquisitions in which a bank has a new top-tier holding company. In many cases, these acquisitions occur simultaneously as one holding company buys another holding company that owns a number of banks. Note that the ' All Mergers' and ' All Acquisitions' results shown in the table do not force all types or mergers or acquisitions, respectively, to have the same effects on lending. Recall that the model has dummy variables for ' mergers of equals,' ' family mergers,' etc., as well as interactions of these dummies with the size of the institution. Thus, we allow these different types of M&As and M&As of different sized institutions to have different effects on lending. We will investigate some of these differences in subsequent tables. The results in Table 3 should be viewed as weighted average effects over the different types of mergers

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their interactions with the BANK SIZE and ORG SIZE variables, as well as all the subsets referring to each category of M&As (e.g., ' acquisitions of equals') were performed -- 60 separate F-tests in all. The parameters were jointly significant at the 1% level in 54 cases, at the 5% level in 3 cases, and they were not significant in 3 cases.

and acquisitions.

The first column of the top panel of Table 3 shows that the 6,369 merging banks invested 3.702% of their gross total assets in small business loans the year before the merger. Combining their balance sheets into 2,508 pro forma banks yields a **static effect** on small business lending of -53.3 basis points to 3.169%, using predicted values from lending equation (1). This decline of about ½ of one percentage point amounts to about $25.8 billion less of small business lending in real 1994 dollars (-.00533 • $4,852.4 billion in GTA), which is about 16% of total small business lending as of 1995 or almost as much as the total small business lending of all banks with GTA below $100 million of $26.8 billion in 1995 shown in Figure 1 above. Thus, the static effect reduces small business lending substantially, as the larger consolidated banks are predicted by the model to devote lesser proportions of their assets to small business loans. This confirms the main result of the static literature on the relationship between bank size and small business lending, but does so in a model that takes into account many more factors than are typically employed in these studies.

The secular change shows that the pro forma banks would be predicted to grow in assets and shrink their small business lending proportions in the absence of the dynamic effects of mergers. The data suggest that these banks would have reduced their proportion of small business lending by 87.9 basis points to 2.290% of GTA.[18] Since secular change applies equally to banks that were involved in M&As and those that were not, these data suggest a strong overall decline in small business lending over time that is independent of bank M&As, consistent with results found elsewhere (e.g., Berger, Kashyap, and Scalise 1995).

The **restructuring effect** -- which measures the impact on small business lending of changes in banking institution size, financial condition, and competitive position after an M&A that are associated with the M&A -- is found to slightly increase the proportion of GTA invested in small business lending by 6.7 basis points to 2.358%, and slightly increasing the size of merged banks from $5,217.9 billion to $5,249.0 billion. These data suggest that any restructuring of the participating banks after M&As is not

[18]This fall in the proportion of assets devoted to small business lending slightly overstates the decline in the quantity of this lending due to secular change, since the 2.290% has a larger GTA in the denominator.

important in terms of their small business lending.

The **direct effect** -- which distinguishes the lending of banks that recently participated in M&As from that of banks of the same size and other characteristics that have not recently undergone M&As -- also appears to increase the proportion of assets invested in small business loans by a very small amount, 4.9 basis points to 2.416% of GTA. Thus, by the end of our three-year dynamic period after mergers, the negative static effect of mergers on small business lending is only slightly offset by the dynamic restructuring and direct effects. This is illustrated in the final column of Table 3, which shows the sum of static, restructuring, and direct effects of mergers to be -41.6 basis points, almost as large as the static effect alone.

The merger results generally show positive effects on lending to medium and large borrowers with bank credit exceeding $1 million, especially to borrowers with credit exceeding $25 million. The positive static effects were expected based on the literature that found that larger banks tend to lend more to larger borrowers in part because of regulatory and market restrictions on the sizes of loans that smaller banks may issue. The positive static effects are offset in part by negative restructuring and direct effects.[19]

The effects of acquisitions shown on the bottom panel of Table 3 reveal a number of similarities to the effects of mergers, but there are some key differences. Recall that an acquisition differs from a merger in that the acquired bank retains its charter and separate identity, but becomes a subsidiary of a new or different top-tier BHC. For small business lending, the static effects on lending are negative, the restructuring effects are very small, and the direct effects are positive. A key difference from the merger results is that the direct effect for acquisitions is relatively large and essentially offsets **all** of the static effect, so total effects of acquisitions on small business lending are approximately zero.

This result -- that holding company acquisitions do not appear to reduce small business lending by the acquired bank -- suggests that acquisitions may be associated with keeping mostly the same lending policies and procedures and loan officers within the bank. The acquired bank's loan officers may have

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[19]The positive overall effects on medium and large business lending also support the hypothesis that through consolidation, banks may be better able to preserve their part of their declining share of the corporate banking market by offering more banking products to companies that have access to the traded securities markets (Berger, Kashyap, and Scalise 1995, Boyd and Gertler 1995, and Boyd and Graham 1996).

strong ties to the local community which enable them to continue extending relationship-based loans to small, informationally opaque borrowers, minimizing the impact of the consolidation on small business lending. The choice of a merger, on the other hand, may more often be associated with a strategic decision to integrate the acquired bank more fully into the acquiring organization, rather than maintaining its local identity, making it less inclined to or less able to extend relationship-based small business loans.

Acquisitions may still have important effects on small business lending in the long run, however, if these acquisitions are preludes to ' family mergers' over the next few years. In some cases, an acquired bank is merged with an existing BHC affiliate some time after the acquisition, which then yields a reduction in small business lending. These family mergers are analyzed separately below. In our data, 41.3% of all mergers (1,036/2,508) are family mergers, and nearly a quarter (23.7%) of newly acquired banks engage in family mergers in the 3 years after acquisition.[20] Importantly, family mergers are likely to increase dramatically in the near future, as relaxation of interstate banking rules under the Riegle-Neal Act of 1994 removes most of the restrictions on family mergers across state lines as of June 1, 1997.

The acquisitions information also suggest more of a shift into medium and large business lending than was the case for mergers. For large loans, the increase in lending is driven by a large positive static effect, suggesting that larger BHCs may help with diversification and allow the acquired banks to initiate more large loans, consistent with the literature cited above.[21]

Table 4 shows the results for one year after M&As (i.e., j=1) for comparison purposes. We analyze mergers that combine 7,916 banks into 3,106 surviving banks, and 4,714 acquisitions of banks that occur over 1979-94. The available set of M&As is slightly different from that used for three years after M&A because we hold the lending years constant at 1980-95 in order to control for the substantial changes in lending behavior over time. That is, one year after M&As and three years after M&As occur in slightly different sets of years, so we eliminate this inconsistency by holding the lending years constant.

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[20]These figures do not include family mergers which occur in the same year as the acquisition, because as noted above, these mixed cases are counted only as mergers and not as acquisitions in our data set.

[21]Unlike mergers, acquisitions do not increase legal lending limits, which are set at the level of the bank, not the BHC. Nonetheless, the ability to sell loan participations at low cost within the holding company organization may allow even relatively small banks to initiate loans to large borrowers in some cases.

We concentrate on the dynamic effects, as the static effects reflect only the differences in sample. The one-year restructuring and direct effects of all mergers on small business lending were 6.6 basis points and 27.1 basis points, respectively. Thus, the short-term restructuring effect is small (similar to the longer term effect), but the short-term direct effect is quite large and offsets most of the static effect. This suggests that immediately after merging, banks may look more favorably on small business lending than other banks of the same size and other characteristics or at least are reluctant to cut much of this lending quickly. However, the direct effect becomes much smaller by three years after the merger, so that a substantial reduction in this lending by merged banks eventually occurs. The effects of acquisitions on small business lending, as well as the effects of both mergers and acquisitions on other types of lending also show considerable differences from the three-year effects shown above in Table 3.

This pattern -- in which most of the changes in lending take place more than a year after merger -- supports the prevailing views of bank managers, consultants, researchers, and the press that a three-year gestation period is needed to complete the transition to a new equilibrium after an M&A. This finding also raises questions about recent applications that employed the small business lending section of the Call Report. It may be the case that the data from this new source has simply not been available long enough to measure much of the dynamic effects of M&As. From this point forward, we will report only the results allowing the full three years after M&As for the dynamic effects to be completed.

The Effects by Type of M&A

Table 5 summarizes the static, restructuring, and direct effects on small business lending by type of M&A. We show the total of these three effects on small business lending of mergers of equals, family mergers, acquisitions of equals, and out-of-state acquisitions, and also include the All Mergers and All Acquisitions categories from Table 3 for comparison.[22] These results may give insights as to which types of consolidation are likely to produce the most change in lending. As noted above, family mergers and out-of-state acquisitions are of particular interest because they bear on the likely future effects of interstate banking.

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[22]These are not exhaustive categories, nor are they mutually exclusive. For example, in some mergers, the participants are neither of roughly equal size, nor are they in the same top-tier BHC, but in other mergers, the participants may be both roughly equal in size and in the same BHC.

The findings shown in Table 5 suggest that all categories of mergers tend to reduce small business lending by comparable amounts. However, for acquisitions, there appears to be considerable heterogeneity. There may be considerable positive effects on lending for acquisitions of equals and for out-of-state acquisitions, in contrast to the essentially zero effect overall. The excluded categories (acquisitions of unequals, in-state acquisitions) yield negative effects on small business lending (-6.1 basis points, -61.0 basis points, respectively). The finding for out-of-state acquisitions runs contrary to some of the results in the literature cited in Section II above and goes against the conventional wisdom that out-of-state acquirers impose non-local policies and procedures that inhibit relationship-driven small business lending. However, as discussed above, such policies may eventually be imposed if these acquisitions are preludes to family mergers with other banks within the BHC, which are found here to decrease small business lending.

The Effects by Absolute and Relative Size of M&A Participants

Table 6 again summarizes the total static, restructuring, and direct effects, now segmented by the absolute and relative sizes of the M&A participants. Absolute size may matter, for example, because small and large institutions start from such different small business lending proportions. Relative size may matter, among other reasons, because banks of differing sizes may have more divergent lending focuses.

The top panel of Table 6 suggests that the impact of mergers on small business lending is **positive** when small and medium size banks (GTA < $1 billion) merge with each other, consistent with Peek and Rosengren (1996,1997) and Strahan and Weston (1996,1997). A possible explanation of this finding is that these mergers allow small and medium sized banks to increase their business lending as a whole, most of which is restricted to small business lending because of legal lending limits and limited diversification. For example, a bank with $50 million in assets and a 6% equity capital ratio has a legal lending limit to a single borrower of $450,000 (15% of equity). A merger with a similar bank would double the size of loans and commitments that are permitted, but any extra lending would still generally count as small business lending.

The negative effect on small business lending generally occurs when large survivor banks (GTA $\geq$ $1 billion) merge with either large or medium sized target banks. These two large bank merger

categories represent about two-thirds of the dollar value of assets merged. The negative effect on small business lending for the larger merger combinations is also consistent with Peek and Rosengren, although Strahan and Weston found no significant effect of large mergers. However, comparisons with prior studies are difficult to make because of our longer sample period, our use of data three years after the mergers, and our structural model that takes into separate account the static, restructuring, and direct effects of M&As.

The bottom panel of Table 6 suggests that acquisitions of large banking organizations by other large organizations (about two-thirds of assets involved in acquisitions) tends to increase small business lending, but the acquisitions of smaller organizations tends to decrease this type of lending. Thus, our earlier result of essentially no change related to acquisitions masked some significant effects that depend on the sizes of the organizations involved. One potential explanation of this heterogeneity is that the purposes of these acquisitions differ. For instance, the very largest acquisitions may often be for the purpose of market expansion by aggressive acquirers, who may wish to expand all types of lending.[23]

The External Effect of M&As

Table 7 shows the external effect of M&As on the lending of **all** banks in the local market in response to the changes in business conditions created by the M&As. As discussed above, even if institutions engaging in M&As reduce their small business lending substantially, the **total** local supply of these loans need not decrease substantially if there is a strong external effect in which other local banks

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[23]We also ran a robustness check using the small business lending sections of the June 1993, 1994, and 1995 Call Reports, which were used by some of the other studies. We re-estimated our small business lending proportion equation (1) using the data for all banks for these three years and then analyzed the findings for the year after the M&As for the 309 mergers and 293 acquisitions with complete data for 1994. These findings were compared with our one-year-after M&A results which were based using STBL data in the estimation. The comparison is imperfect because our STBL results are based on a much longer period of estimation (16 years versus 3 years) and because we can only replicate the one-year dynamic analysis, in which we have much less confidence than our three-year analysis. The merger results came out quite similar, with the STBL and Call predicting 0.0250% and 0.0358% increases in small business loans from 1994 mergers, respectively. This positive finding is consistent between the two data sets for 1994 mergers, but differs from our finding of a negative effect from mergers over the much longer 1979-1994 period, possibly suggesting a change over time. The estimates for 1994 acquisitions differ, with the STBL yielding a positive estimate and the Call yielding a negative estimate. This may reflect the heterogeneity in the acquisition results overall, which yielded essentially a zero effect overall, but strong negative and positive effects for different groups.

or nonbanks pick up many of these loans. This external effect is not likely to be important or reliable for loans to larger business borrowers, because these borrowers typically have access to external credit outside the local market. As discussed above, small businesses tend to rely on nearby banks to provide them with financial services, and our analysis of the external effect centers on these local market banks.[24] The external effect has been neglected in prior empirical analyses of the effects of bank consolidation on small business lending.

The first column of Table 7 shows the proportions of GTA devoted to the loan categories assuming no M&As in the local market, i.e., by taking the predicted values from equation (1) setting all the MARKET PAST M&A variables to zero. The remaining columns reflect the effects of setting some of these variables to their actual proportions of local market assets involved in M&As. The merger results suggest that other banks in the local market do tend to increase their small business lending by 8.5 basis points of their assets, which tends to offset the decline in small business lending by merging banks themselves. The results tend to differ, depending upon the type of merger involved. Similarly, acquisitions tend to increase small business lending by other local banks by 3.9 basis points of GTA, and this effect differs by type of acquisition, with some types having a negative effect on lending by other local banks. The general finding of positive, statistically significant effects of both mergers and acquisitions on small business lending by other local banks suggests that any conclusions about the impacts of banking consolidation that fail to take into account the reactions of other banks may be misleading.

The Total Effects of M&As on Small Business Lending

The external effect measured in Table 7 raises the important question of to what extent the estimated reductions in small business lending reported above for merging banks may be offset by increases in small business lending by other local banks. That is, the total supply of small business loans depends upon all the banks in the local market (as well as nonbanks which are not included here). The results given thus far are difficult to compare because the static, restructuring, and direct effects of M&As

[24]Prior research has also found that local market banking concentration affects the rates charged on small business loans (e.g., Hannan 1991, Berger and Hannan 1997).

are expressed in terms of the assets of the **consolidating** institutions, whereas the external effect is expressed in terms of the assets of **all** the banks in the nation. Table 8 puts these effects in comparable terms by multiplying by the appropriate assets and adding up the estimated real dollar magnitudes. The static effect is shown to reduce small business lending by an estimated $25.8 billion, which as noted above represents about 16% of total current small business loans. The positive restructuring and direct effects tend to offset the negative static effect by increasing small business lending by $3.5 billion and $2.6 billion, respectively, but these effects are relatively weak in economic significance. The estimated external effect of $48.6 billion, however, more than offsets the reduction in lending by the merging banks. As noted earlier, we do not believe that the external effect is measured as accurately as the three effects of M&As on the participating banks, and we view it primarily as a qualitative indicator of the direction and general magnitude of the reaction of other banks.[25] Despite this acknowledged imprecision, the strong, positive external effect should be looked upon as evidence in support of the notion that other banks in the local market may respond positively to the change in competitive conditions brought about by a local merger, and offset much if not all of the reduction in supply of these loans by merging banks. For acquisitions, the external effect tends to operate in the same way by increasing small business lending, although there is no reduction in lending by acquired banks to offset because the positive direct effect alone appears to offset the negative static effect. Thus, overall, we cannot reject the notion that the **total** supply of small business credit associated with M&As is either unchanged or perhaps positive, despite the finding that mergers tend to reduce such loans by the merging banks.

As an additional caveat, we measure only quantities of credit, not prices charged. Prior evidence on relationship lending suggests that as a bank-small business borrower relationship matures, the interest rates charged and collateral requirements decline as the bank gains information on the borrower (Berger and Udell 1995). This suggests that some borrowers that may be dropped by consolidating banks and picked up by other banks through the external effect may have to pay higher rates or pledge more

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[25]The external and other effects are also slightly noncomparable because the external effect takes into account the entire 3-year merger history of the local market, whereas the other effects trace out the impacts of each M&A individually, removing the confounding effects of any additional M&As over the following 3 years.

collateral in the short term until their new banking relationship matures.

VI. Conclusions

In this study we address an issue that is currently the subject of considerable debate and concern -- Is the consolidation of the U.S. banking industry substantially reducing the supply of credit to small businesses? Much has been made of the static cross-sectional relationship between banking institution size and the proportion of assets devoted to small business lending. However, such analysis ignores the basic nature of M&As as dynamic events which take place for the purpose of changing the focus of the participants, as well as to increase size. It also neglects the reaction of other potential lenders that could offset any reduction in the supply of small business loans by M&A participants.

While several recent papers have viewed this issue in a dynamic context, our study departs significantly from these papers and rest of the extant literature in a number of ways. We examine three distinct effects of M&As on the small business lending by the participants. The **static effect** captures the melding of the balance sheets of the consolidating banks into a larger institution, and the **restructuring** and **direct** effects capture two sources of change in the focus of the consolidating institutions after the M&A is completed. Unlike the literature, we also follow the effects of M&As three years after consolidation to capture more of the dynamic effects. We are also the first to examine the **external effect** -- the impact of M&As on small business lending by other banks in the same local market. Without taking into account the reaction of other banks, one cannot draw conclusions about the overall impact of consolidation on the supply of small business credit. Finally, to the best of our knowledge, this is the most exhaustive analysis of the impact of mergers and acquisitions on the lending behavior of banks. Our data and methodology permit us to analyze the effects of the great majority of M&As from the late 1970s through the early 1990s (over 6,000 M&As involving over 10,000 banks) on the lending behavior of virtually all U.S. banks.

Our results indicate that the effects of M&As may be more complex than previous analyses would suggest. While the static aggregation of banking institutions is associated with a considerable negative impact on small business lending, there are significant offsetting effects. In the case of mergers (consolidation of bank charters), the external reaction of other banks in the same local markets appears

to offset much if not all of the negative static effect, whereas the dynamic restructuring and direct effects on lending by the consolidating banks themselves appear to be relatively minor. This is consistent with a reasonably well-functioning dynamic marketplace in which some relationship-based small business loans may be dropped because the merged institutions no longer have a comparative advantage in making this type of loan, but other local lenders step forward and reissue these loans if they are positive net present value investments. A short-term cost of switching may be paid by the borrower, however, through higher rates or more collateral requirements until the new banking relationship matures. In the case of acquisitions (change of top-tier BHC with charter retained), the negative static effect is offset by both the direct effect of the acquisition and by the external effect. Contrary to popular belief, acquisitions by out-of-state banking organizations do not appear to be associated with a reduction in small business lending by the participating banks.

The absolute and relative sizes of the participating banks also appear to matter. Consistent with earlier work, we find that small and medium size bank mergers are associated with an increase in small business lending. However, larger bank mergers are in general associated with a decrease in small business lending. For acquisitions the opposite result obtains -- large holding company acquisitions appear to increase small business lending, whereas smaller acquisitions may tend to decrease this type of lending. However, acquisitions are often preludes to ' family mergers' between banks in the holding company in the following few years, which could decrease small business lending. Such family mergers are likely to increase dramatically in the near future, given the relaxation of interstate branching rules.

We caution that our results on past M&As may not necessarily be accurate predictors of the effects of M&As in the future. In the last few years, there has been heightened awareness of and concern about the potential problems of small business borrowers by the public and by state and federal legislative and regulatory bodies. The small business lending section of the June Call Reports published since 1993 -- which is itself a byproduct of this heightened awareness -- gives the interested parties information on the small business lending behavior of all U.S. banks on an annual basis. Perhaps in part in reaction to the heightened awareness and scrutiny, some banking institutions seeking to participate in M&As have made commitments to continue or increase small business lending after consolidation. For example, Wells Fargo

pledged to make $25 billion in small business loans in the ten years following its consolidation with First Interstate.

Recent changes in the regulatory environment could also change the focus of financial institutions regarding small business lending. For example, family mergers of cross-state affiliates of the same BHC in the future may or may not yield the same effects as past family mergers within a state. Technological changes may affect small business lending in the future as well. As analytical and information technologies such as credit scoring and artificial intelligence decrease the cost of lending to small businesses, the organizational issues that may have discouraged small business lending by larger banking institutions may diminish.

Despite these caveats, however, it seems likely that whatever changes occur in the supply of small business credit by banks participating in M&As, there may be a significant external effect that will offset much of this change in supply. Most observers project that thousands of small, community banks -- which tend to specialize in small business lending -- will survive consolidation of the banking industry. Nonbank lenders, such as commercial finance companies, are also available to supply credit to small businesses. To the extent that profitable small business lending opportunities continue to exist, and many small banks and nonbank lenders continue to exist, it seems likely that the total supply of small business credit will not change drastically in response to the consolidation of the banking industry.

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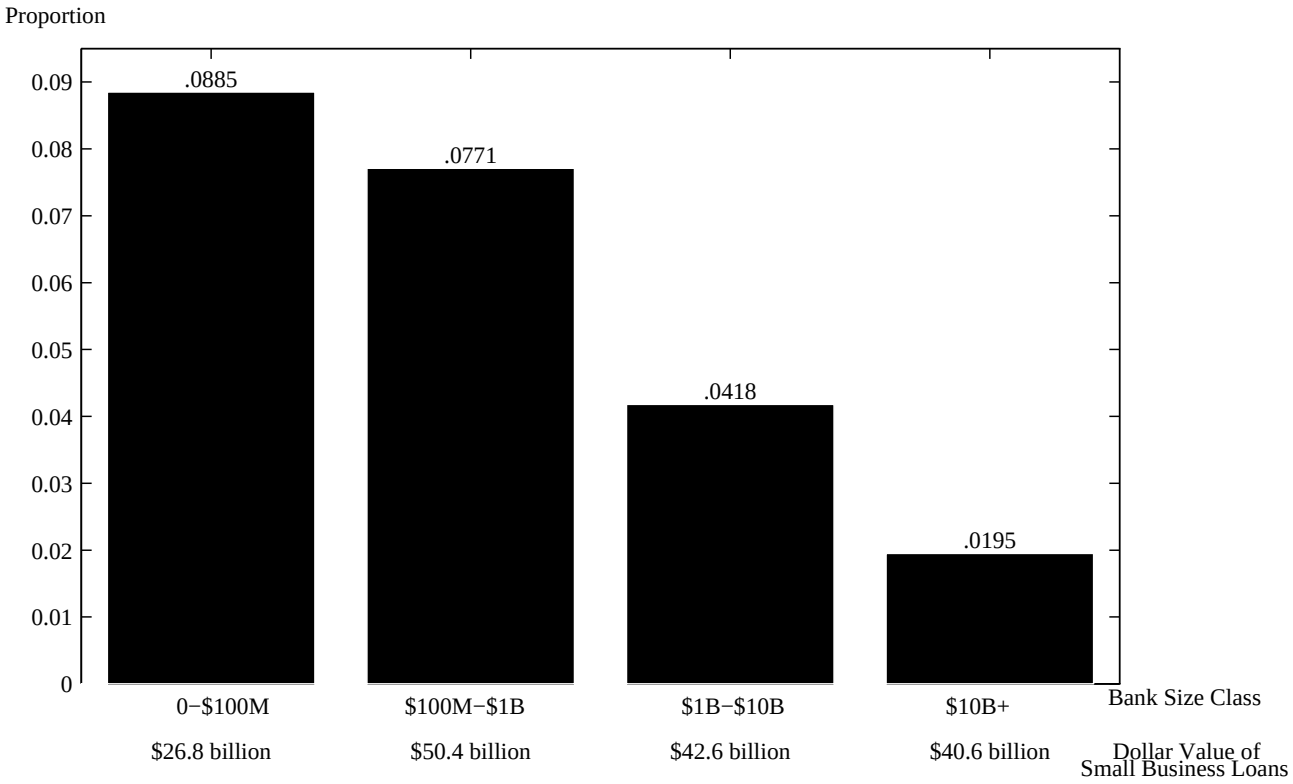
Figure 1: Proportions of Gross Total Assets in Domestic C&I Loans to Borrowers with Bank Credit < $1 Million



Source: Consolidated Report of Condition and Income, June 1995

All financial values are expressed in 1994 dollars using the GDP implicit price deflator.

Table 1

Merger & Acquisition Activity 1979 - 1994[a]

	Industry		All Mergers		Mergers Of Equals		Family Mergers		All Acquisitions		Acquisitions Of Equals		Out-of-State Acquisitions	
Year	Banks	GTA	Banks[b]	GTA	Banks[c]	GTA	Banks[d]	GTA	Banks[e]	GTA	Banks[f]	GTA	Banks[g]	GTA
1979	14,124	$3,257B	113	$199B	25	$28B	48	$51B	132	$26B	31	$6B	7	$12B
1980	14,404	$3,267B	104	$206B	21	$6B	24	$28B	206	$31B	26	$11B	6	$1B
1981	14,387	$3,250B	120	$174B	30	$24B	28	$28B	291	$34B	50	$10B	1	$1B
1982	14,402	$3,310B	189	$237B	36	$18B	54	$59B	385	$64B	64	$18B	17	$10B
1983	14,402	$3,398B	202	$240B	47	$38B	51	$54B	430	$101B	89	$29B	32	$24B
1984	14,375	$3,482B	212	$299B	57	$55B	65	$87B	560	$105B	176	$36B	60	$24B
1985	14,263	$3,658B	198	$399B	38	$26B	71	$181B	529	$150B	108	$48B	72	$67B
1986	14,041	$3,838B	215	$386B	50	$92B	89	$115B	588	$121B	96	$9B	134	$60B
1987	13,538	$3,823B	292	$564B	76	$84B	132	$211B	491	$157B	86	$27B	178	$107B
1988	12,965	$3,833B	311	$547B	84	$57B	168	$229B	518	$224B	141	$120B	202	$105B
1989	12,554	$3,866B	253	$517B	76	$100B	143	$266B	255	$76B	53	$44B	79	$62B
1990	12,194	$3,801B	235	$527B	63	$100B	131	$240B	228	$103B	49	$38B	82	$74B
1991	11,789	$3,707B	256	$485B	60	$76B	152	$300B	276	$203B	99	$172B	125	$124B
1992	11,347	$3,681B	274	$680B	84	$393B	124	$337B	295	$91B	71	$10B	130	$66B
1993	10,866	$3,803B	299	$755B	94	$138B	112	$519B	330	$93B	56	$4B	136	$75B
1994	10,359	$4,024B	323	$720B	88	$88B	99	$192B	326	$99B	67	$43B	122	$81B
Total			3,596	$6,935B	929	$1,323B	1,491	$2,897B	5,840	$1,678B	1,262	$625B	1,383	$893B

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.
[b] Number of banks having survived a merger during the calendar year.
[c] Number of banks having survived merger where the GTA of the acquired institution were between 1/3 and 2/3 of the acquiring bank's GTA.
[d] Number of banks having survived merger where the acquired institution had the same top-tier holding company.
[e] Number of banks who switched top-tier holding companies during the year. Information on bank acquisitions is dominated by the merger data.
[f] Number of banks who switched top-tier holding companies during the year where the GTA of the acquiring BHC was between 1/3 and 2/3 of the GTA of the acquired banks previous organization.
[g] Number of banks who switched to an out-of-state top-tier holding company during the year.
Note: In the analysis below we also include the impact of M&As occurring in 1977 and 1978.

Table 2

Definitions and Sample Means of Variables Employed in the Analysis

(All financial values are in 1000's of constant 1994 dollars.)

Symbol	Definition	Sample Means	
		STBL Banks	All Banks
	A. Loan Proportions[1]		
P_1	Proportion of gross total assets (GTA) lent to 'small' business borrowers with below $1 million in bank credit.	.075	___
P_2	Proportion of GTA lent to 'medium' business with $1 million to $25 million in bank credit.	.060	___
P_3	Proportion of GTA lent to 'large' business with over $25 million in bank credit.	.018	___
	B. Bank and Organization Size Variables (BANK AND ORG SIZE)		
LNGTA	Log of bank gross total assets (GTA). Also included as second-order term (**1/2 LNGTA**^{2}). Interacted with **MERGED** variables below as well.	13.528	10.958
SMALLBANK	Dummy variable, equals one if bank has GTA below $100 million. Excluded from the regressions as the base case.	.250	.741
MEDBANK	Dummy variable, equals one if bank has GTA of $100 million to $1 billion.	.281	.230
LARGEBANK	Dummy variable, equals one if bank has GTA of $1 billion to $10 billion.	.353	.025
HUGEBANK	Dummy variable, equals one if bank has GTA over $10 billion.	.116	.004
LNORGGTA, 1/2 LNORGGTA^2, SMALLORG, MEDORG, LARGEORG, HUGEORG	Same as **BANK SIZE** variables, except defined over all the banking assets in the organization (high holding company). **LNORGGTA** is interacted with **ACQUIRED** variables below as well. By construction, **BANK SIZE** and **ORG SIZE** variables are identical for independent banks and banks in one-bank holding companies.		
	C. Bank and Organization Financial Variables (BANK AND ORG FINANCIAL)		
EQRAT	Bank equity to GTA ratio. Also included as as second-order term (**1/2 EQRAT**^{2}).	.071	.087

Symbol	Definition	STBL Banks	All Banks
LLRRAT	Bank loan loss reserve to total loan ratio. Also included as second-order term (**1/2 LLRRAT^2**).	.018	.015
OREORAT	Bank Other Real Estate Owned to total loan ratio. Also included as second-order term (**1/2 OREORAT^2**).	.008	.009
NPFRAT	Bank nonperforming loans (past due and nonaccrual) to total loan ratio. Also included as second-order term (**1/2 NPFRAT^2**).	.030	.029
PFRAT	Purchased funds (deposits > $100,000, foreign deposits, federal funds purchased, subordinated debt, other non-deposit liabilities) to GTA ratio. Also included as second-order term (**1/2 PFRAT^2**).	.251	.136
ORGEQRAT, 1/2 ORGEQRAT^2, ORGLLRRAT, 1/2 ORGLLRRAT^2, ORGOREORAT, 1/2 ORGOREORAT^2, ORGNPFRAT, 1/2 ORGNPFRAT^2, ORGPFRAT, 1/2 ORGPFRAT^2	Same as **BANK FINANCIAL** variables, except defined over all the banking assets in the organization.		
	D. Local Market Competitive Position Variables (COMP POSITION)		
BANKHERF	Herfindahl index of concentration of local market (MSA or non-MSA county), weighted by the proportion of the bank's deposits in each of its markets.	.204	.234
BANKSHARE	Bank's share of market deposits, weighted in the same fashion as HERF.	.194	.154
ORGHERF	Same as **BANKHERF**, except defined over all the bank deposits of the organization.	.213	.241
ORGSHARE	Same as **BANKSHARE**, except defined over all the bank deposits of the organization.	.204	.167
	E. Organizational Complexity Variables (ORG COMPLEXITY)		
BHCOWNED	Dummy variable, equals one if bank is owned by a bank holding company.	.831	.593
MULTILEVELBHC	Dummy variable, equals one if the main 'direct holder' is not the 'high holder', i.e., that there are at least two levels of holding company.	.141	.057
PUBLICLYTRADED	Dummy variable, equals one if bank's high holder is registered with the SEC for public trading.	.606	.222
OUT-OF-STATE	Dummy variable, equals one if bank's high holder is located in another state.	.136	.045

Symbol	Definition	STBL Banks	All Banks
	F. Past Merger and Acquisition Variables (PAST M&A) **(Means shown only for the first lag)**		
MERGEDk	Dummy variable, equals one if bank survived one or more mergers (i.e., absorbed the assets of one or more other banks) k years ago, k=1,2,3. Also interacted with **LNGTA** variable above.	.100	.017
MERGEDk-EQ	Dummy variable, equals one if bank survived 'mergers of equals' in which it had between 1/3 and 2/3 of the total pro forma GTA in its mergers k years ago, k=1,2,3. Also interacted with **LNGTA** variable above.	.012	.005
MERGEDk-FAM	Dummy variable, equals one if bank survived one or more 'family mergers' in which affiliates of the same high holding company were combined k years ago, k=1,2,3. Also interacted with **LNGTA** variable above.	.045	.007
ACQUIREDk	Dummy variable, equals one if bank was acquired (i.e., changed high holder) k years ago, k=1,2,3. Also interacted with **LNORGGTA** variable above.	.038	.028
ACQUIREDk-EQ	Dummy variable, equals one if bank was acquired and the acquiring high holder had between 1/3 and 2/3 of the total pro forma organization's GTA before acquisition k years ago, k=1,2,3. Also interacted with **LNORGGTA** variable above.	.012	.006
ACQUIREDk-OUT	Dummy variable, equals one if bank was acquired by a high holder located in another state k years ago, k=1,2,3. Also interacted with **LNORGGTA** variable above.	.017	.007
PURCHk	Dummy variable, equals one if bank's high holder acquired other banks (i.e., banks other than this bank) k years ago, k=1,2,3. Also interacted with **LNORGGTA** variable above.	.169	.070
	F. Market Past Merger and Acquisition Variables (MARKET PAST M&A)		
MAR-MERGEDk, MAR-MERGEDk-EQ, MAR-MERGEDk-FAM, MAR-ACQUIREDk, MAR-ACQUIREDk-EQ, MAR-ACQUIREDk-OUT, MAR-PURCHk	Weighted average proportions of **PAST M&A** variables of all the banks in the same local markets (MSA or non-MSA county). **MAR-MERGEDk, MAR-MERGEDk-EQ,** and **MAR-MERGEDk-FAM** are also interacted with **LNGTA**, and **MAR-ACQUIREDk, MAR-ACQUIREDk-EQ, MAR-ACQUIREDk-OUT,** and **MAR-PURCHk** are also interacted with **LNORGGTA**.		

Symbol	Definition	STBL Banks	All Banks
	G. Time Variables (TIME)		
YEARt	Dummy variables, equal one if the lending takes place in year t, t=1980,...,1995. All year dummies are included, and no intercept is specified in the equation.	___	___
	H. Environmental Variables (ENVIRONMENT)		
INMSA	Dummy variable, equals one if the bank is in a Metropolitan Statistical Area.	.698	.433
STATEs	Dummy variable, equals one if the bank is in State s, s=1,...,50 to cover all U.S. states and the District of Columbia except for California, which is excluded as the base case.	___	___
FED	Dummy, equals one if the bank's primary federal regulator is the Federal Reserve.	.119	.077
FDIC	Dummy, equals one if the bank's primary federal regulator is the FDIC. Banks regulated by the OCC constitute the base case.	.315	.602
OCC	Dummy, equals one if the bank's primary federal regulator is the OCC. Excluded from the regressions as the base case.	.566	.321

Data Sources: Federal Reserve Survey of Terms of Bank Lending to Business
Consolidated Report of Condition and Income for Banks (Schedule RC)
Consolidated Report of Condition and Income for Bank Holding Companies (Schedule Y9-C)
FDIC Summary of Deposits
National Information Center Entity Structure Data File

[1]The lending by borrower size category can only be observed over time for STBL banks, and so only these banks were included in the estimation of equation (1) (although the other equations use all banks). The flows of loan originations reported in the STBL were converted into estimates of the stocks of loans used in the P_1, P_2, and P_3 proportions by weighting the flows throughout the year by the size and duration of the loans (see Berger, Kashyap, and Scalise 1995, pp. 193-5 for more details). Of the 5,351 annual bank observations available, 853 were not used in equation (1) because of M&A activity in the same year. The remaining 4,500 were used in the P_1 and P_2 versions of equation (1). The P_3 version eliminated observations in which either the bank or organization had less than $100M in GTA, leaving 3,232 observations. For this regression we also deleted the **MEDBANK** and **MEDORG** variables and treated medium size as the base case in place of small size. The reason for this treatment is that small banks almost all have either zero or very small proportions of loans to borrowers with over credit over $25 million, which would make the intercept in this equation (for small banks in small organizations being the base case) essentially equal to minus infinity, which would create obvious estimation problems.

Table 3
Decomposition of the Effects of Merger and Acquisition Activity
On Aggregate Domestic C&I Lending 1980 - 1995[a]
Three Years after M&A

	Pre-merger	Static Effect	Pro forma	Secular Change	Pro forma + Secular	Restructuring Effect	Pro forma + Secular + Restr.	Direct Effect	Pro forma + Secular + Restr. + Direct	Total Static + Restr. + Direct Effects[b]
	All Mergers									
Number of banks	6,369		2,508		2,508		2,508		2,508	
Gross total assets (billions)	4852.4		4852.4		5217.9		5249.0		5249.0	
Lending proportions to borrowers with bank credit:										
Less than $1 million	0.03702	-0.00533**	0.03169	-0.00879**	0.02290	0.00067**	0.02358	0.00049*	0.02416	-0.00416**
$1 million - $25 million	0.08641	0.00337**	0.08977	0.00160**	0.09137	-0.00205**	0.08941	-0.00097**	0.08856	0.00035
Greater than $25 million	0.05918	0.01442**	0.07360	0.00709**	0.08069	-0.00153**	0.07941	-0.01006**	0.06857	0.00283*
Total	0.18261	0.01246**	0.19506	-0.00010	0.19496	-0.00291**	0.19240	-0.01054**	0.18129	-0.00098
	All Acquisitions									
Number of banks	4,146		4,146		4,146		4,146		4,146	
Gross total assets (billions)	1100.0		1100.0		1206.0		1258.9		1258.9	
Lending proportions to borrowers with bank credit:										
Less than $1 million	0.06054	-0.00638**	0.05416	-0.01396**	0.04020	0.00032**	0.03992	0.00616**	0.04659	0.00011
$1 million - $25 million	0.08565	0.00267**	0.08832	0.00236**	0.09068	0.00004	0.09118	0.00579**	0.09631	0.00851**
Greater than $25 million	0.05229	0.02660**	0.07889	-0.00088	0.07801	-0.00276**	0.07530	-0.01343**	0.06199	0.01041**
Total	0.19848	0.02289**	0.22137	-0.01248**	0.20889	-0.00240**	0.20639	-0.00147	0.20488	0.01902**

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.
[b] Total is the sum of the weighted averages specified. This total does not take into account the slight changes in GTA across columns. We correct for these differences in Table 6.
* Significantly different from zero at the 5% level, two-tailed.
** Significantly different from zero at the 1% level, two-tailed.

Table 4
Decomposition of the Effects of Merger and Acquisition Activity
On Aggregate Domestic C&I Lending 1980 - 1995[a]
One Year after M&A

	Pre-merger	Static Effect	Pro forma	Secular Change	Pro forma + Secular	Restructuring Effect	Pro forma + Secular + Restr.	Direct Effect	Pro forma + Secular + Restr. + Direct	Total Static + Restr. + Direct Effects[b]
					All Mergers					
Number of banks	7,916		3,106		3,106		3,106		3,106	
Gross total assets (billions)	6253.1		6253.1		6574.8		6457.6		6457.6	
Lending proportions to borrowers with bank credit:										
Less than $1 million	0.03324	-0.00417**	0.02906	-0.00398**	0.02524	0.00066**	0.02606	0.00271**	0.02879	-0.00081*
$1 million - $25 million	0.08738	0.00509**	0.09248	-0.00134**	0.09129	-0.00014**	0.09130	0.01261**	0.10401	0.01756**
Greater than $25 million	0.05691	0.01165**	0.06856	0.01063**	0.07908	-0.00085**	0.07834	-0.01035**	0.06829	0.00045
Total	0.17753	0.01257**	0.19010	0.00531**	0.19561	-0.00033	0.19569	0.00497**	0.20109	0.01720**
					All Acquisitions					
Number of banks	4,714		4,714		4,714		4,714		4,714	
Gross total assets (billions)	1276.5		1276.5		1333.9		1359.1		1359.1	
Lending proportions to borrowers with bank credit:										
Less than $1 million	0.05723	-0.00614**	0.05109	-0.00694**	0.04435	-0.00005	0.04396	0.00715**	0.05117	0.00096*
$1 million - $25 million	0.08686	0.00052	0.08739	0.00040	0.08762	-0.00082**	0.08687	-0.00284**	0.08390	-0.00314**
Greater than $25 million	0.05621	0.03135**	0.08756	0.00467**	0.09116	0.00258**	0.09496	-0.02769**	0.06747	0.00624**
Total	0.20031	0.02574**	0.22605	-0.00186*	0.22312	0.00171**	0.22580	-0.02338**	0.20254	0.00407**

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.
[b] Total is the sum of the weighted averages specified. This total does not take into account the slight changes in GTA across columns. We correct for these differences in Table 6.
* Significantly different from zero at the 5% level, two-tailed.
** Significantly different from zero at the 1% level, two-tailed.

Table 5

Effects of Merger and Acquisition Activity
On Domestic C&I Lending < $1 Million
by Type of M&A[a]
Three Years after M&A

	All Mergers	Mergers Of Equals	Family Mergers	All Acquisitions	Acquisitions Of Equals	Out-of-State Acquisitions
Number of pro forma banks	2,508	615	1,036	4,146	938	796
Gross total assets (billions)	4852.4	1027.4	1910.2	1100.0	375.3	554.5
Total Static, Restructuring, plus Direct Effects	-0.00416**	-0.00288*	-0.00405**	0.00011	0.00150**	0.00622**

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.

Table 6

Effects of Merger and Acquisition Activity On Domestic C&I Lending < $1 Million by Absolute and Relative Size of Participants[a] Three Years after M&A

Mergers

Size of Survivor	Size of Target: Small GTA < $100M	Medium GTA $100M-$1B	Large GTA ≥ $1B
Small (GTA < $100M)			
Number of pro forma banks	689		
Gross total assets (billions)	55.6		
Total Static, Restructuring, plus Direct Effects	0.06210**		
Medium (GTA $100M-$1B)			
Number of pro forma banks	589	293	
Gross total assets (billions)	185.6	180.8	
Total Static, Restructuring, plus Direct Effects	0.01318**	0.01286**	
Large (GTA ≥ $1B)			
Number of pro forma banks	122	192	83
Gross total assets (billions)	579.9	932.7	1147.8
Total Static, Restructuring, plus Direct Effects	0.00139	-0.00449**	-0.01046**

Acquisitions

Size of Acquirer Organization	Size of Acquired Organization: Small ORGGTA < $100M	Medium ORGGTA $100M-$1B	Large ORGGTA ≥ $1B
Small (ORGGTA < $100M)			
Number of acquired banks	721		
Gross total assets (billions)	21.7		
Total Static, Restructuring, plus Direct Effects	-0.01149**		
Medium (ORGGTA $100M-$1B)			
Number of acquired banks	948	398	
Gross total assets (billions)	44.4	66.2	
Total Static, Restructuring, plus Direct Effects	-0.00242*	-0.00946**	
Large (ORGGTA ≥ $1B)			
Number of acquired banks	472	711	634
Gross total assets (billions)	28.9	152.3	603.4
Total Static, Restructuring, plus Direct Effects	0.00155	-0.00619**	0.00233*

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.

Table 7
External Effect of M&A Activity in Local Market
On Aggregate Domestic C&I Lending[a]
Three Years after M&A

	Lending proportions Assuming no M&As	All Mergers	Mergers of Equals	Family Mergers	All Acquisitions	Acquisitions of Equals	Out-of-State Acquisitions	Other BHC Purchases
Lending proportions to borrowers with bank credit:								
Less than $1 million	0.03473	0.00085**	0.00021**	0.00010**	0.00039**	-0.00037**	-0.00052**	0.00035**
$1 million - $25 million	0.07212	0.00121**	0.00174**	0.00182**	-0.00082**	0.00061**	0.00168**	0.00282**
Greater than $25 million	0.05399	0.00138**	-0.00077**	-0.00027**	0.00097**	-0.00083**	0.00069**	0.00375**
Total	0.16084	0.00344**	0.00118**	0.00165**	0.00054**	-0.00059**	0.00185**	0.00691**

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.
* Significantly different from zero at the 5% level, two-tailed.
** Significantly different from zero at the 1% level, two-tailed.

The first column is the estimated lending distribution for every bank - across all years - as if there were no M&A activity in the bank's market. The remaining columns are the estimated changes in the lending distribution for EVERY bank in the market due to the M&A activity of all market banks.

Table 8
Total Magnitudes of the Effects of M&A Activity
On Aggregate Domestic C&I Lending[a]
Three Years after M&A

	All Mergers					All Acquisitions				
	Billions of Dollars									
	Static	Restructuring	Direct	External	Total	Static	Restructuring	Direct	External	Total
	Longer Term (three years out)									
Lending proportions to borrowers with bank credit:										
Less than $1 million	-25.8	3.5	2.6	48.6	28.9	-7.0	0.4	7.8	22.6	23.7
$1 million - $25 million	16.3	-10.8	-5.1	69.6	70.1	2.9	0.1	7.3	-47.1	-36.8
Greater than $25 million	70.0	-8.0	-52.8	79.5	88.6	29.3	-3.5	-16.9	55.7	64.6
Total	60.5	-15.3	-55.3	91.4	81.3	25.2	-3.0	-1.8	-6.9	13.4

[a] Financial values are expressed in 1994 dollars using the GDP implicit price deflator.
[b] The purpose of this table is to show general magnitudes. Statistical significance can not be computed because the static, restructuring, and direct effects of M&As are based upon the projected effects of mergers assuming no confounding effects from interceding M&As, whereas the external effect is based upon actual data for all banks inclusive of interceding M&As. Although the magnitudes are not strictly additive, they should nevertheless give good rough estimates of the general magnitudes.

The columns are the estimated changes in the lending distribution for EVERY bank in the country not just those engaging in M&A activity.

Table A1

Grouped Logit Regressions of the Probability that a Dollar of GTA is Allocated to a Credit Availability Size Class

	$ln(P_1/(1-P_1))$		$ln(P_2/(1-P_2))$		$ln(P_3/(1-P_3))$	
	Less than $1 million		$1 million - $25 million		Greater than $25 million	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
MEDBANK	0.694*	2.12	0.103	0.16	.	.
LARBANK	0.742*	2.01	0.299	0.45	-4.754**	-10.06
HUGBANK	0.433	1.14	0.254	0.38	-4.443**	-8.95
LNGTA	-0.455	-1.20	0.284	0.79	7.543**	7.73
$1/2LNGTA^2$	0.001	0.06	-0.030	-1.37	-0.438**	-7.52
EQRAT	-3.191	-0.35	-5.983	-1.50	26.037**	4.01
$1/2EQRAT^2$	14.045	0.12	85.559*	1.99	-86.302	-1.73
PFRAT	-0.113	-0.19	2.633**	6.54	4.054**	4.47
$1/2PFRAT^2$	-3.825**	-3.05	-5.219**	-6.43	-5.286**	-3.03
LLRRAT	-5.404	-0.69	-3.306	-0.61	23.475*	2.18
$1/2LLRRAT^2$	78.694	0.37	160.460	1.09	-1087.936**	-3.49
OREORAT	-16.534**	-3.19	-7.055*	-2.15	3.962	0.72
$1/2OREORAT^2$	170.887	1.34	-133.592	-1.38	512.381**	3.23
NPFRAT	-6.260*	-2.30	0.057	0.03	-0.041	-0.01
$1/2NPFRAT^2$	61.114	1.81	0.222	0.01	8.626	0.24
MEDORG	0.158	0.42	-1.324	-1.07	.	.
LARORG	0.109	0.26	-1.420	-1.13	3.386**	4.68
HUGORG	0.283	0.65	-1.419	-1.13	3.313**	4.38
LNORGGTA	0.490	1.33	1.787**	4.96	-3.048**	-3.08
$1/2LNORGGTA^2$	-0.036	-1.58	-0.110**	-5.11	0.186**	3.22
ORGEQRAT	-23.339*	-2.20	-13.086*	-2.35	-91.461**	-9.98
$1/2ORGEQRAT^2$	234.863	1.63	246.627**	3.41	966.972**	8.09
ORGPFRAT	0.442	0.66	0.049	0.11	-5.577**	-5.91
$1/2ORGPFRAT^2$	-0.174	-0.12	-0.462	-0.51	6.945**	3.83
ORGLLRRAT	-31.630**	-3.52	-3.854	-0.60	-21.329	-1.59
$1/2ORGLLRRAT^2$	461.616	1.85	-112.956	-0.64	1066.415**	2.78
ORGOREORAT	0.396	0.06	13.399**	3.04	-10.172	-1.45
$1/2ORGOREORAT^2$	28.769	0.19	-153.154	-1.05	-73.686	-0.26
ORGNPFRAT	13.904**	3.72	2.346	0.86	7.031	1.40
$1/2ORGNPFRAT^2$	-48.761	-1.02	-2.641	-0.07	-145.517*	-2.32
BHCOWNED	0.227**	2.74	0.390**	3.47	0.390	1.08
MULTILEVELBHC	0.457**	9.51	-0.055	-1.76	0.093	1.68
OUT-OF-STATE	-0.151*	-2.47	0.297**	7.13	-0.276**	-3.26
PUBLICLYTRADED	-0.220**	-4.73	-0.109**	-3.20	-0.360**	-5.91
FED	-0.186**	-4.70	-0.248**	-9.87	0.122**	2.94
FDIC	0.208**	3.62	-0.186**	-3.28	1.376**	9.61
INMSA	0.355**	3.29	0.621**	3.46	1.772**	4.09
BANKHERF	1.034*	2.15	-0.278	-0.72	-5.258**	-6.48
BANKSHARE	0.469	1.36	0.489	1.81	1.431*	2.39
ORGHERF	0.052	0.09	-1.297**	-2.72	5.841**	6.17
ORGSHARE	0.603	1.50	0.070	0.23	-2.499**	-3.94
MERGED1	2.516**	2.92	-1.114	-1.38	-4.619*	-2.51
MERGED2	-0.769	-0.92	-2.552**	-3.44	4.956**	2.92
MERGED3	0.705	0.83	1.163	1.64	-7.057**	-4.08
MERGED1 · LNGTA	-0.165**	-3.03	0.078	1.57	0.287**	2.63
MERGED2 · LNGTA	0.039	0.75	0.154**	3.40	-0.296**	-2.92
MERGED3 · LNGTA	-0.048	-0.90	-0.066	-1.53	0.415**	4.06
MERGED1-EQ	-0.532	-0.26	2.873*	2.04	-3.377	-1.21
MERGED2-EQ	4.420*	2.43	2.244*	2.02	-6.061**	-2.61
MERGED3-EQ	4.552**	2.96	-0.680	-0.70	-4.004	-1.87
MERGED1-EQ · LNGTA	0.038	0.30	-0.190*	-2.22	0.179	1.08
MERGED2-EQ · LNGTA	-0.288*	-2.54	-0.139*	-2.08	0.379**	2.79
MERGED3-EQ · LNGTA	-0.312**	-3.22	0.033	0.56	0.246*	1.97
MERGED1-FAM	-4.509**	-3.67	-0.239	-0.25	2.123	1.02
MERGED2-FAM	-3.240**	-2.68	1.063	1.18	-6.694**	-3.42
MERGED3-FAM	1.043	0.86	-1.056	-1.20	7.256**	3.89

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	$ln(P_1/(1-P_1))$		$ln(P_2/(1-P_2))$		$ln(P_3/(1-P_3))$	
	Less than $1 million		$1 million - $25 million		Greater than $25 million	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
MERGED1-FAM · LNGTA	0.301**	3.84	0.017	0.29	-0.157	-1.28
MERGED2-FAM · LNGTA	0.228**	2.98	-0.064	-1.16	0.383**	3.28
MERGED3-FAM · LNGTA	-0.065	-0.85	0.052	0.96	-0.428**	-3.89
ACQUIRED1	-2.724	-1.35	-2.812	-1.12	-2.248	-0.26
ACQUIRED2	-2.646	-1.48	-1.450	-0.88	13.990*	2.13
ACQUIRED3	-1.257	-0.75	-2.580	-1.53	-22.261**	-3.43
ACQUIRED1 · LNORGGTA	0.176	1.44	0.184	1.22	0.147	0.29
ACQUIRED2 · LNORGGTA	0.164	1.49	0.120	1.21	-0.899*	-2.37
ACQUIRED3 · LNORGGTA	0.071	0.70	0.182	1.81	1.290**	3.47
ACQUIRED1-EQ	0.510	0.22	6.543*	2.57	-10.680	-1.60
ACQUIRED2-EQ	-0.792	-0.38	1.773	0.92	-7.671	-1.47
ACQUIRED3-EQ	-0.460	-0.24	1.811	0.97	11.071	1.81
ACQUIRED1-EQ · LNORGGTA	-0.011	-0.08	-0.418**	-2.77	0.600	1.58
ACQUIRED2-EQ · LNORGGTA	0.062	0.50	-0.137	-1.20	0.540	1.79
ACQUIRED3-EQ · LNORGGTA	0.041	0.35	-0.119	-1.09	-0.618	-1.77
ACQUIRED1-OUT	3.619	1.34	-6.799*	-2.42	7.313	0.85
ACQUIRED2-OUT	-0.796	-0.34	1.896	0.97	-14.743*	-2.38
ACQUIRED3-OUT	-5.227*	-2.37	0.559	0.31	18.194**	2.82
ACQUIRED1-OUT · LNORGGTA	-0.214	-1.36	0.362*	2.18	-0.469	-0.91
ACQUIRED2-OUT · LNORGGTA	0.047	0.34	-0.143	-1.24	0.875*	2.46
ACQUIRED3-OUT · LNORGGTA	0.328*	2.53	-0.073	-0.70	-1.065**	-2.90
PURCH1	-0.752	-1.44	-0.975*	-2.50	2.356**	3.06
PURCH2	1.598**	2.92	1.568**	3.88	-3.259**	-3.82
PURCH3	0.458	0.85	0.432	1.05	-0.022	-0.02
PURCH1 · LNORGGTA	0.049	1.52	0.058*	2.52	-0.146**	-3.31
PURCH2 · LNORGGTA	-0.102**	-3.04	-0.094**	-3.93	0.190**	3.87
PURCH3 · LNORGGTA	-0.029	-0.89	-0.028	-1.16	-0.008	-0.16
MAR-MERGED1	0.330	0.19	4.896**	2.79	-12.493**	-2.82
MAR-MERGED2	-7.284**	-4.04	0.114	0.06	-1.855	-0.41
MAR-MERGED3	-2.060	-1.17	-2.184	-1.28	12.309**	3.01
MAR-MERGED1 · LNGTA	-0.033	-0.28	-0.323**	-2.98	0.724**	2.74
MAR-MERGED2 · LNGTA	0.501**	4.32	0.015	0.12	0.080	0.30
MAR-MERGED3 · LNGTA	0.158	1.41	0.118	1.12	-0.721**	-2.95
MAR-MERGED1-EQ	-3.554	-1.17	-7.061**	-2.83	26.438**	5.14
MAR-MERGED2-EQ	0.386	0.12	-3.117	-1.23	11.076*	2.06
MAR-MERGED3-EQ	-7.801**	-2.59	2.919	1.19	10.437*	1.96
MAR-MERGED1-EQ · LNGTA	0.237	1.22	0.455**	2.96	-1.509**	-4.89
MAR-MERGED2-EQ · LNGTA	0.023	0.11	0.225	1.45	-0.706*	-2.20
MAR-MERGED3-EQ · LNGTA	0.576**	2.98	-0.125	-0.83	-0.665*	-2.09
MAR-MERGED1-FAM	1.175	0.47	-2.985	-1.34	24.539**	4.75
MAR-MERGED2-FAM	9.683**	3.62	7.274**	3.15	12.472*	2.25
MAR-MERGED3-FAM	2.980	1.06	0.921	0.40	-12.938*	-2.51
MAR-MERGED1-FAM · LNGTA	-0.083	-0.52	0.201	1.46	-1.405**	-4.55
MAR-MERGED2-FAM · LNGTA	-0.684**	-3.93	-0.479**	-3.33	-0.693*	-2.08
MAR-MERGED3-FAM · LNGTA	-0.202	-1.11	-0.007	-0.05	0.756*	2.44
MAR-ACQUIRED1	-6.149	-1.52	6.371	1.40	27.705	1.60
MAR-ACQUIRED2	0.047	0.01	3.798	0.83	-47.497**	-2.92
MAR-ACQUIRED3	2.126	0.55	3.747	0.83	7.881	0.55
MAR-ACQUIRED1 · LNORGGTA	0.380	1.47	-0.399	-1.44	-1.711	-1.70
MAR-ACQUIRED2 · LNORGGTA	-0.016	-0.06	-0.267	-0.98	2.795**	2.97
MAR-ACQUIRED3 · LNORGGTA	-0.060	-0.25	-0.318	-1.19	-0.411	-0.50
MAR-ACQUIRED1-EQ	10.212*	2.04	-4.145	-0.79	5.153	0.34
MAR-ACQUIRED2-EQ	9.430	1.86	-7.855	-1.44	58.272**	3.11
MAR-ACQUIRED3-EQ	1.146	0.27	4.045	0.87	-5.692	-0.43
MAR-ACQUIRED1-EQ · LNORGGTA	-0.649*	-2.10	0.238	0.76	-0.170	-0.19
MAR-ACQUIRED2-EQ · LNORGGTA	-0.580	-1.87	0.502	1.57	-3.472**	-3.25
MAR-ACQUIRED3-EQ · LNORGGTA	-0.160	-0.61	-0.200	-0.75	0.204	0.27

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	$ln(P_1/(1-P_1))$		$ln(P_2/(1-P_2))$		$ln(P_3/(1-P_3))$	
	Less than $1 million		$1 million - $25 million		Greater than $25 million	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
MAR-ACQUIRED1-OUT	4.626	0.98	6.296	1.25	-45.340**	-2.63
MAR-ACQUIRED2-OUT	7.832	1.65	-0.378	-0.07	32.534	1.86
MAR-ACQUIRED3-OUT	2.318	0.53	-16.932**	-3.48	10.233	0.72
MAR-ACQUIRED1-OUT · LNORGGTA	-0.285	-0.97	-0.366	-1.21	2.659**	2.65
MAR-ACQUIRED2-OUT · LNORGGTA	-0.508	-1.71	0.068	0.23	-1.797	-1.78
MAR-ACQUIRED3-OUT · LNORGGTA	-0.237	-0.87	1.098**	3.84	-0.525	-0.64
MAR-PURCH1	3.360**	3.30	3.188**	3.46	-9.218**	-4.43
MAR-PURCH2	-0.043	-0.04	0.034	0.04	6.218**	3.16
MAR-PURCH3	-1.270	-1.22	-0.492	-0.53	8.573**	4.07
MAR-PURCH1 · LNORGGTA	-0.204**	-3.25	-0.192**	-3.54	0.534**	4.43
MAR-PURCH2 · LNORGGTA	0.005	0.07	0.001	0.02	-0.345**	-3.01
MAR-PURCH3 · LNORGGTA	0.089	1.39	0.044	0.79	-0.484**	-3.96
YEAR80	1.308	0.66	-16.588**	-7.09	-40.952**	-6.38
YEAR81	1.198	0.60	-16.672**	-7.12	-40.842**	-6.36
YEAR82	0.958	0.48	-16.691**	-7.13	-40.643**	-6.33
YEAR83	0.723	0.36	-16.855**	-7.20	-40.301**	-6.28
YEAR84	0.661	0.33	-16.731**	-7.15	-40.466**	-6.30
YEAR85	0.148	0.07	-17.004**	-7.26	-40.383**	-6.30
YEAR86	0.216	0.11	-16.862**	-7.20	-40.597**	-6.34
YEAR87	0.139	0.07	-16.946**	-7.24	-40.342**	-6.30
YEAR88	0.316	0.16	-16.761**	-7.16	-40.603**	-6.34
YEAR89	0.345	0.17	-16.703**	-7.13	-40.586**	-6.33
YEAR90	0.386	0.19	-16.577**	-7.08	-40.798**	-6.36
YEAR91	0.242	0.12	-16.736**	-7.14	-40.631**	-6.33
YEAR92	0.107	0.05	-16.667**	-7.11	-40.804**	-6.36
YEAR93	0.242	0.12	-16.609**	-7.09	-40.964**	-6.38
YEAR94	0.369	0.19	-16.712**	-7.13	-40.966**	-6.38
YEAR95	0.249	0.13	-16.524**	-7.05	-40.712**	-6.34
AL	0.471**	4.00	-0.080	-0.71	-0.079	-0.28
AK	-0.170	-0.37	-0.391	-0.75	-3.653	-0.65
AZ	-0.104	-0.78	0.033	0.25	-0.331	-1.09
AR	-1.080**	-2.91	0.561	1.14	-2.005	-0.32
CO	-0.154	-1.15	-0.010	-0.09	0.271	0.54
CT	-0.706**	-3.70	1.054**	5.29	1.871**	3.74
DE	-0.307	-1.18	-0.120	-0.56	-0.064	-0.22
DC	-0.670**	-4.40	-0.528**	-4.84	-0.059	-0.26
FL	-0.790**	-3.64	-1.087**	-4.87	0.263	0.86
GA	-0.169	-1.22	0.577**	6.19	-0.307	-1.69
HI	-0.420**	-2.60	0.148	0.92	-0.606	-1.52
ID	0.330	1.38	-0.545	-1.24	2.591	1.02
IL	0.032	0.35	0.279**	4.51	0.674**	6.85
IN	-0.228	-1.85	-0.202	-1.72	-1.070*	-2.47
IA	-0.229	-0.90	-0.247	-0.53	-1.496	-0.08
KS	-0.374	-1.08	1.350	1.24	2.969	0.56
KY	-0.114	-0.95	0.293**	3.22	-0.126	-0.57
LA	0.364**	3.10	0.136	1.24	1.457	1.90
ME	-0.398	-1.13	-0.223	-0.61	-0.977	-0.07
MD	-0.205	-1.93	-0.131	-1.66	-0.441*	-2.57
MA	-0.142	-1.50	0.067	1.08	0.691**	6.90
MI	0.275**	3.03	0.122	1.78	0.507**	4.15
MN	-0.211	-1.63	0.296**	3.63	0.520**	3.47
MS	-0.722**	-3.06	-0.022	-0.14	-0.032	-0.04
MO	-0.376**	-3.12	-0.299**	-3.40	0.206	1.05
MT	-0.184	-0.39	0.895	0.36	-7.095	-0.01
NE	-0.708*	-2.31	-0.440	-1.24	-6.332	-0.12
NV	-0.043	-0.21	0.055	0.25	-5.104	-0.60
NH	-0.095	-0.31	-0.327	-0.96	-11.734	-0.22
NJ	0.314**	2.96	0.111	1.25	-0.623*	-2.38
NM	0.388	0.92	0.434	0.41	-3.429	-0.13
NY	-0.210**	-3.05	0.127**	2.71	0.188*	2.42
NC	-0.221*	-2.34	0.170*	2.38	0.180	1.34

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	$ln(P_1/(1-P_1))$		$ln(P_2/(1-P_2))$		$ln(P_3/(1-P_3))$	
	Less than $1 million		$1 million - $25 million		Greater than $25 million	
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
ND	-1.887	-0.68	-11.365	-0.01	.	.
OH	-0.205*	-2.33	0.011	0.17	0.170	1.29
OK	-0.141	-1.01	-0.075	-0.64	0.513	1.07
OR	-0.179	-1.54	-0.029	-0.32	0.696**	3.93
PA	-0.264**	-3.22	0.267**	4.58	0.500**	4.89
RI	-1.225**	-7.84	0.427**	4.82	-0.490*	-2.30
SC	-0.171	-0.35	0.187	0.23	-1.246	-0.03
SD	-0.572	-1.12	0.048	0.08	-12.690	-0.05
TN	-0.174	-1.59	0.110	1.30	0.759**	2.83
TX	-0.131	-1.46	0.214**	3.32	0.931**	8.02
UT	0.314	1.41	-0.619*	-2.01	0.141	0.11
VT	-0.401	-1.25	0.221	0.42	1.542	0.12
VA	-0.871**	-6.04	-0.348**	-3.54	0.526**	3.14
WA	0.336**	3.57	0.091	1.05	0.654**	3.00
WV	-0.968	-0.81	-12.341	-0.03	-9.801	0.00
WI	-0.036	-0.30	0.173	1.81	-0.883**	-3.05
WY	0.036	0.12	-1.196	-1.21	2.484	0.24
N	4,500		4,500		3,232	
Adjusted R^2	0.96		0.96		0.96	

* Indicates significance at the 5% level.
** Indicates significance at the 1% level.

Note: In the vast majority of cases, we have the exact total of domestic C&I lending for each bank, but the exact distribution among the three classes of borrowers needs to be estimated using STBL data. In order for these estimates to sum to the actual total, we multiply them by an adjustment factor, which is equal to the ratio of the bank's actual total C&I lending to the sum of the predicted lending from the STBL-based model. In the few cases where we do not have the exact value of a bank's total C&I lending, we use the average adjustment factor for the bank's size class for the specified year.