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Abstract

We examine the effects of bank M&As on small business lending using data on over 6,000 recent U.S. bank M&As. We are the first to decompose the impact of M&As into static effects from simply melding the antecedent institutions, and dynamic effects associated with post-M&A refocusing of the consolidated institution. We are also the first to estimate the dynamic reactions of other local banks. We find that the static effects of consolidation reduce small business lending, but are mostly offset by the reactions of other banks, and in some cases also by refocusing efforts of the consolidating institutions themselves.

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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. Since that time, banking has been in a state of continuous transition, with bank mergers and acquisitions averaging over 600 per year. During the first half of the 1990s alone, banks with more than 20% of the industry's assets were involved in M&As in each and every year. Given the magnitude of this consolidation and the importance of this 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, including 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 businesses, particularly small businesses that depend on banks for external credit. According to a recent small business survey, commercial banks are the single most important source of credit to small firms (Cole, Wolken, and Woodburn 1996). Prior research has established a 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).

To illustrate, banks with less than \$100 million in assets devoted almost 9% of their portfolios to small business lending (i.e., loans to business borrowers with bank credit less than \$1 million) based on the June 1995 Call Report, whereas banks with over \$10 billion in assets invested less than 2% of their assets in these loans. On the surface, this finding would seem to suggest that as bank assets are shifted 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 to become so consolidated that all banks were larger than \$10 billion and if the propensities to lend to small business were to remain constant, small business lending would fall by more than half.

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 focus. 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 other dynamic changes in behavior.

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 same local markets.

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, much like our simple example above. The remaining effects are dynamic. The restructuring effect identifies the change in lending that follows from any restructuring of the institution in terms of its size, financial characteristics, and local market competitive position. For example, the consolidated institution may 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 lending propensities. The direct effect of M&As captures the change in lending attributable to a direct change in lending focus above and beyond the changes associated with the transformations of institution size and other characteristics created by the static and restructuring effects. That is, the direct effect captures the difference in lending between the new 'restructured' institution and the lending of an otherwise similar institution that has not undergone a recent M&A. Finally, the external effect captures the dynamic responses to M&As of other lenders in the same local markets. Importantly, the external effect incorporates the possibility that some loans that are dropped by the consolidating institutions may represent valuable business opportunities for other nearby banks or nonbank lenders. Thus, even if merging institutions reduce their small business lending substantially, the total supply of these loans need not change substantially because some or all of these loans could be picked up by other institutions.

We measure the static, restructuring, direct, and external 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. 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 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 time series allows us to examine a large number of M&As and leaves enough time for most of the dynamic effects to occur and be measured.

We find 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 the dynamic effects. For bank mergers (consolidations of two or more bank charters), the external effect suggests a strong positive reaction by other banks in the same local markets. For BHC acquisitions (the banks retain their separate charters), the direct and external effects are each large 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 other local banks may be particularly important. We also find 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 motivates each of the effects of M&As on the supply of small business lending, and Section IV econometrically models these effects. Section V presents our empirical analysis, and 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.¹ 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.²

Other factors associated with M&As beyond changes in 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 bank owners had difficulty controlling inefficient or self-serving managers. These difficulties may be more severe in banking than in other industries because geographic restrictions on intrastate and interstate banking and other regulatory restrictions may have

¹See Ang (1992), Petersen and Rajan (1994,1995), Berger and Udell (1995), Houston and James (1995,1998), Blackwell and Winters (1997), Angelini, DiSalvo, and Ferri (1998), Berlin and Mester (1998), and Cole (1998) for more evidence regarding relationship lending to small business.

²Consistent 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).

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 renewed, or may increase small business lending to the extent that some positive net present value loans that were formerly neglected are made.³

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. Because it began in June 1993, 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 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 (see Keeton 1995, Whalen 1995, Berger and Udell 1996). Some studies have concentrated on the liberalization of state geographic

³It is alternatively possible that increases in competitiveness may eliminate some positive net present value small business loans to relationship borrowers as greater 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).

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.

More in line with the analysis in this paper, several studies have pursued dynamic approaches by comparing lending before and after M&As. Peek and Rosengren (1996,1998), Strahan and Weston (1996,1998), Craig and Santos (1997), Kolari and Zardkoohi (1997a,b), Zardkoohi and Kolari (1997), and Walraven (1997) used the recent June Call Report information on small business lending. Peek and Rosengren and Strahan and Weston both generally found that M&As between small banking institutions increased small business lending. Strahan and Weston also found that M&As between large institutions and small institutions or between large institutions and other large institutions yielded no clear effect on small business lending. In contrast, however, Peek and Rosengren found decreases in small business lending associated with M&As between large institutions, although their results also depend importantly on small business lending propensity of the acquiring bank prior to consolidation. Craig and Santos generally found no clear effect of M&As of either type, with the results depending crucially on the econometric method employed. Kolari and Zardkoohi and Zardkoohi and Kolari also found mixed results, with larger institutions generally reducing small business lending after acquisition, with mergers reducing small business lending more than acquisitions, and with more complex organizations often increasing small business lending after consolidation. Walraven generally found that merging banks tend to revert to the small business lending propensity of the surviving bank. 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 of these small banks, particularly purchases by out-of-state institutions, were associated with reductions in small business lending.

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 may be 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.⁴ 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 better equipped to extend more loans.⁵

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

⁴The number of M&A approvals reported here differs from the number of M&As 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.

⁵Empirical 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).

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 extend. 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 of 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. In some cases, loan officers that leave the consolidated institution may take some of their relationship-based loan portfolios with them and start a de novo bank or join other local competitors. Consistent with the possibility, Goldberg and White (1998) and DeYoung (1998) 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. Potentially, the external effect could fully offset, or even more than offset the change in lending by consolidating banks, depending upon the dynamics of the change in competitive conditions in the market. The external effect could even move in the same direction as these other effects, as for example, if an acquirer increased the supply of small business loans and local banks respond to the more aggressive competitor by also increasing their supplies. Thus, inclusion of the external effect is critical to any analysis of the impact of M&As on the total supply of small business lending.

In our empirical analysis below, we measure the external effects of M&As on 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.⁶

The empirical literature discussed above that uses the small business lending section of the Call 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. 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,' where a top-tier holding company refers to a BHC that is not owned by any other higher-tier

⁶For 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).

BHC. The surviving top-tier BHC is referred to as the 'acquirer', and the banks that were directly purchased or were in holding companies that were purchased as the 'acquired.' 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, which is an interesting empirical question on its own.

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. We analyze lending in terms of GTA, which includes loan loss reserves, 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.

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 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:

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

The definitions and sample means of all the variables in equation (1) are given in Table 1. 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.⁷ 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 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 $\frac{1}{2}\text{LNGTA}^2$, as well as dummies for bank size class measured in real 1994 dollars. The size classes are SMALLBANK ($\text{GTA} < \$100$ million), MEDBANK ($\$100$ million - $\$1$ billion), LARGE BANK ($\$1$ billion - $\$10$ billion), and HUGE BANK ($> \$10$ 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

⁷ 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.

reserves/total loans, other real estate owned/total loans, nonperforming loans/total loans, and second-order terms in these ratios (i.e., $\frac{1}{2}X^2$) 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 (Metropolitan Statistical Area (MSA) or non-MSA county). 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.

The ORG COMPLEXITY variables control for the organizational structure of the institution, 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. 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 extend some large business loans.

The PAST M&A variables account for the bank's M&A activity in the past three years, and are used for measuring the 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 policies and procedures. The variables MERGED k , $k=1,2,3$ indicate whether the bank is a survivor of one or more bank mergers k years ago. The variables MERGED k -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 MERGED k -FAM denote whether the MERGED k were 'family mergers' of banks that were already in the same top-tier BHC. The ACQUIRED k , $k=1,2,3$ variables indicate whether the bank was acquired k years ago, i.e., switched to the control of a different top-tier BHC. Similarly, ACQUIRED k -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 ACQUIRED k -OUT designate whether 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. Finally, the PURCHK denote whether the bank's top-tier BHC purchased other banks, in order 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-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.

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 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. These values are substituted into equation (1) to yield the proportion of assets predicted to be invested in loans to borrower size category i during year t for the pro forma bank, P_{it}^{PF} . To measure the static effect, we subtract off the weighted average of the predicted values of proportions of GTA that Banks A and B would lend to borrower category i during year t if they had not been merged, i.e.,

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

Measurement of the Restructuring Effect

The restructuring effect measures the change in lending associated with the changes in the 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 size, 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:

$$\begin{aligned} \Delta \text{LNGTA}_{t+j-1} = & g^j (\text{BANK AND ORG SIZE}_{t-1}, \text{BANK AND ORG FINANCIAL}_{t-1}, \\ & \text{BANK AND ORG COMP POSITION}_{t-1}, \text{ORG COMPLEXITY}_{t-1}, \\ & \text{PAST M\&A}_{t-1,t-2,t-3}, \text{MARKET PAST M\&A}_{t-1,t-2,t-3}, \text{TIME}_{t-1}, \\ & \text{ENVIRONMENT}_{t-1}, \text{CURRENT M\&A}_{t-1}, \\ & \text{MARKET CURRENT M\&A}_{t-1}) + \eta_{t+j-1}^j, \quad j \geq 1, \end{aligned} \quad (3)$$

where $\Delta \text{LNGTA}_{t+j-1} = \text{LNGTA}_{t+j-1} - \text{LNGTA}_{t-1}$. 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 (3) 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 (3) 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 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 equations (3) 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 equations (3) for the change in variables from $t-1$ to t .

The secular change in LNGTA is measured by the predicted value of (3), 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). Thus, the secular change 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. Put another way, the secular change is identical for all banks of a given size, financial condition, etc., whether or not they underwent a current M&A, although we only measure it for the consolidating institutions. This procedure is repeated for the changes in 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 the changed values for size, condition, and competitive position into the estimates of equation (1).

To estimate the restructuring effect, we repeat this process, except that the CURRENT M&A vector has the appropriate values of MERGED k , MERGED k -EQ, etc. instead of all zeroes as in the secular change prediction model. Thus, the restructuring effect of M&As on lending is given by the predicted lending proportions in (1) based on the institution's size, financial condition, and competitive position that embody the effect of the current M&A less the predicted value after the static effect and secular change.

Measurement of the Direct Effect

The direct effect is the additional effect of M&As on lending after taking into account the restructuring of the bank from the other effects. 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 effect, secular change, and restructuring effects. That is, it is the effect of “turning on” the PAST M&A variables to include the effect of the current M&A being analyzed by putting ones in the PAST M&A vector the appropriate number of years back. Thus, the dynamic direct effect of a merger of equals three years after it occurred is taken from the predicted value of equation (1) setting MERGED3 and MERGED3-EQ equal to one, less the predicted value of (1) with these variables set to zero, with all other right-hand-side variables inclusive of the other M&A and secular changes.

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. The external effect is incorporated by setting the MARKET PAST M&A variables to their actual values. The difference in predicted value of (1) between setting these variables to their actual values and setting them to zero is our estimate of the external effect.

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 business borrowers.

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 and the adjusted R^2 s were corrected, as in prior research (e.g., Berger and Udell 1996).⁸ We estimated equations (3) by OLS for the one-year and three-year changes in the 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 2 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 3. 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 shown in Table 2, so the M&As range from 1977-92, three years before the lending data.⁹ Note that the 'All Mergers' and 'All Acquisitions' results shown

⁸The parameter estimates for equations (1) are shown in our working paper listed in the references.

⁹We include all M&As except those involving failed banks and those with incomplete data, which would make our results less accurate depictions of typical M&As if they were included. The excluded banks account for only a small proportion of the bank assets involved in M&As, and we do not believe that their exclusion substantially affects the results shown in the tables.

in the table do not force all types of 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 2 should be viewed as weighted average effects over the different types of mergers and acquisitions.

Looking first at the merger results, the first column of the top panel of Table 2 shows that the 6,369 merging banks invested 3.702% of their gross total assets in small business loans the year before the merger. The static effect combines the balance sheets of these banks, reducing their number by 3,641 to 2,508 surviving pro forma banks. More than half of the bank charters disappear because there were multiple targets in the same year for some survivor banks. The static effect reduces the small business lending proportion of the pro forma banks by 53.3 basis points, using predicted values from lending equation (1). This decline of about $\frac{1}{2}$ of one percentage point amounts to about \$25.8 billion less of small business lending in real 1994 dollars ($-.00533 \cdot \$4,852.4$ billion in GTA), which is about 16% of total small business lending as of 1995. This substantial reduction of small business lending 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 of GTA. 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 slightly increases the proportion of GTA invested in small business lending by 6.7 basis points, and slightly increases the assets of the merged banks by about \$31 billion. These data suggest that any restructuring of the participating banks after M&As is not very important.

The direct effect also appears to increase the proportion of assets invested in small business loans by

a very small amount, 4.9 basis points 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 positive restructuring and direct effects. This is illustrated in the final column of Table 2 -- the sum of static, restructuring, and direct effects of mergers is -41.6 basis points, almost as large as the static effect alone. As a caveat, we note that the individual static and dynamic effects are subject to measurement error and that some part of each effect may potentially be attributed to another effect. Nevertheless, the sum of these effects is negative, large in magnitude, and statistically significant, giving us confidence that overall effect of mergers on the small business lending of the merging banks is negative.

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 make. The positive static effects are offset in part by negative restructuring and direct effects.

As shown in the bottom panel of Table 2, we also analyze 4,146 acquisitions in which a bank has a new top-tier holding company, and retains its charter. In many cases, these acquisitions occur simultaneously as one holding company buys another holding company that owns a number of banks. The acquisitions data reveal a number of similarities to the effects of mergers, but there are some key differences. 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 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 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. 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 removed 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.

To check the main results and to give some insights as to how well the parameters of equation (1) are working to produce the direct effects of M&As on small business lending, we also computed several derivatives or marginal effects of the PAST M&A variables on small business lending and calculated several F-tests on the PAST M&A coefficients. We computed derivatives of the small business lending proportion with respect to 6 categories of M&As, mergers ($\partial P / \partial \text{MERGED}_k$), mergers of equals ($\partial P / \partial \text{MERGED}_k + \partial P / \partial \text{MERGED}_{k-\text{EQ}}$), family mergers ($\partial P / \partial \text{MERGED}_k + \partial P / \partial \text{MERGED}_{k-\text{FAM}}$), and similarly for acquisitions, acquisitions of equals, and out-of-state acquisitions. For each of the 6 main types of M&As, we calculated the derivatives for the 3 lags, i.e., for $k = 1, 2, 3$. The results were heterogenous, and depended on the size of the bank or organization because of the interaction terms. At the mean values for LNGTA and LNORGGTA, only 6 of the 18 derivatives were positive, but at the maximum values for institution size, 11 of 18 were positive. These results suggest that the positive direct effects shown in Table 2 primarily reflect the large institutions (which receive the greatest weights in the weighted averages shown), and that the type of merger or acquisition might also matter. We will investigate this heterogeneity further below when we break out the results by institution

size and by type of M&A. The PAST M&A variables were also generally statistically significant when evaluated in logical groupings. Specifically, we conducted F-tests of the PAST M&A variables and their interaction terms for each of the 6 main types of M&As, of all the merger parameters jointly, of all the acquisition parameters jointly, and of all the PAST M&A variables jointly. The parameters were jointly significant at the 1% level in 7 of 9 cases.

Table 3 shows the results for one year after M&As (i.e., $j=1$) for comparison purposes. We analyze mergers that combine 7,916 banks, reducing them by 4,810 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. 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 2.

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 have 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 4 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 2 for comparison. 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.

The findings shown in Table 4 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 5 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 5 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 (1996,1998) and Strahan and Weston (1996,1998). 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 5 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.¹⁰

¹⁰We also conducted 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 used 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.

The External Effect of M&As

Table 6 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 or nonbanks pick up many of these loans. This external effect is not likely to capture the bulk of the external market for loans to larger business borrowers, because these borrowers typically have access to credit on a regional or nationwide basis. 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. 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 6 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 in fact 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 impact of banking consolidation that fail to take into account the reactions of other banks may be misleading.¹¹

The Total Effects of M&As on Small Business Lending

¹¹We also checked the derivatives and performed F-tests on the parameters involving the MARKET PAST M&A variables, analogous to our checks of the PAST M&A variables above. Again, there was some heterogeneity in the results, and this heterogeneity is reflected in some of the differing signs of the results shown in Table 6. At the mean values for LNGTA and LNORGGTA, 11 of the 18 derivatives were positive, and 9 were positive at the maximum values for institution size. Of the 9 F-tests of the sets of parameters, 7 showed joint significance at the 1% level, and 1 showed significance at the 5% level.

The external effect measured in Table 6 raises the important issue of the extent to which 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 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 7 puts these effects in comparable terms by multiplying by the appropriate assets and adding up the estimated real dollar magnitudes. The static effect of mergers is shown to reduce small business lending by an estimated \$25.8 billion, which as noted above represents about 16% of total 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. 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. However, in this case, there is no reduction in lending by acquired banks to offset, since 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 a caveat, we measure only quantities of credit, and not the other terms of the loan.. Prior evidence on relationship lending suggests that as a bank-small business borrower relationship matures, the interest rates charged and collateral requirements may 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, pledge more collateral, or be subject to stricter covenants in the short term until their new banking relationship matures. In addition, some of the small business borrowers who continue to receive credit from the consolidated institutions may pay higher rates or otherwise be subject to stiffer contract terms.

As an additional caveat, since we do not control for borrower characteristics other than the size of their bank credit, consolidating banks may change their mix of borrowers in ways that we do not measure. For example, the Williamson-based theory discussed above suggests that larger, more organizationally complex institutions that are created by M&As may reduce their supplies of credit to informationally opaque, relationship borrowers, and perhaps increase their supplies to informationally transparent transactions borrowers. Although borrower size may be highly correlated with informational opacity and other borrower characteristics, we caution that we can only measure how M&As affect different sizes of borrowers, and we cannot tell directly the effect of M&As on information-problematic relationship borrowers versus transparent transactions borrowers.

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 the rest of the extant literature in a number of ways. We examine three distinct effects of M&As on the small business lending of 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 strategic focus of the consolidating institutions after their M&As are

completed. Unlike the literature, we also follow the effects of M&As three years after the M&A event 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, it is impossible to 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 bank lending behavior. Our data and methodology permit us to analyze the effects of over 6,000 M&As over a variety of economic conditions from the late 1970s through the early 1990s on the lending 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 (consolidations 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. In the case of acquisitions (changes 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 conventional wisdom and to some prior research results, acquisitions by out-of-state banking organizations do not appear here 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' among banks in the same 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.

On the whole, our findings are consistent with a reasonably well-functioning dynamic marketplace in

which some relationship-based small business loans may be dropped because consolidated institutions no longer have a comparative advantage in making this type of loan, but other local lenders step forward and extend these loans if they are positive net present value investments. Nevertheless, several important caveats are in order. First, our analysis concentrates only on credit quantities and not prices or other contract terms. It is quite possible that as a result of banking industry consolidation, small business borrowers are paying higher rates or otherwise dealing with harsher contract terms in ways that we do not measure. This is most likely to be case for borrowers that are dropped by consolidating banks and are picked up by other lenders via our external effect. Such borrowers may suffer temporary disruptions in credit availability, and may have to pay higher rates, pledge more collateral, or face more restrictive loan covenants until their new banking relationships mature.

We also note that our data set does not contain borrower characteristics other than our measure of the size of their bank credit. It is quite possible that consolidating banking institutions may change their mixes of borrowers in ways that we do not detect. For example, consolidating institutions may substitute transactions-based loans to relatively informationally transparent small businesses in place of some relationship-based loans to relatively informationally opaque small borrowers.

We also caution that our results on past M&As may not necessarily accurately predict the effects of future M&As. In the last few years, there has been heightened legislative, regulatory, and public concern over the issue of credit availability for small businesses. The small business lending section of the June Call Reports published since 1993 -- which is itself a byproduct of this heightened concern -- makes available to all interested parties information on the small business lending behavior of every U.S. bank 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 that are now allowed may or may not yield the same effects past family mergers of within-state affiliates.

Technological changes may affect small business lending in the future as well. As analytical and information technologies such as credit scoring 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.

REFERENCES

- Akhavein, J.D., A.N. Berger, and D.B. Humphrey, 1997, The effects of bank megamergers on efficiency and prices: Evidence from the profit function, *Review of Industrial Organization* 12, 95-139.
- Ang, J.S., 1992, On the theory of finance for privately held firms, *Journal of Small Business Finance* 1, 185-203.
- Angelini, P., R. DiSalvo, and G. Ferri, 1998, Availability and cost for small businesses: Customer relationships and credit cooperatives, presented at the Conference on Small Business Finance, New York University.
- Benston, G.J., W.C. Hunter, and L.D. Wall, 1995, Motivations for bank mergers and acquisitions: Enhancing the deposit insurance put option versus earnings diversification, *Journal of Money, Credit, and Banking* 27, 777-88.
- Berger, A.N., and D.B. Humphrey, 1992, Megamergers in banking and the use of cost efficiency as an antitrust defense, *Antitrust Bulletin* 37, 541-600.
- Berger, A.N., A.K. Kashyap, and J.M. Scalise, 1995, The transformation of the U.S. banking industry: What a long, strange trip it's been, *Brookings Papers on Economic Activity* 2, 55-218.
- Berger, A.N., A. Saunders, J.M. Scalise, and G.F. Udell, 1997, The effects of bank mergers and acquisitions on small business lending, *Finance and Economics Discussion Series* 97-28, Board of Governors of the Federal Reserve.
- Berger, A.N., and G.F. Udell, 1995, Relationship lending and lines of credit in small firm finance, *Journal of Business* 68, 351-82.
- Berger, A.N., and G.F. Udell, 1996, Universal banking and the future of small business lending, edited by A. Saunders and I. Walter, *Financial system design: The case for universal banking*, Burr Ridge, IL, Irwin: 559-627.
- Berlin, M. and L.J. Mester, 1998, On the profitability and cost of relationship lending, *Journal of Banking and Finance* 22.
- Blackwell, D. and D.B. Winters, 1997, Banking relationships and the effect of monitoring on loan pricing, *Journal of Financial Research* 20, 275-89.
- Cole, R.A., 1998, The importance of relationships to the availability of credit, *Journal of Banking and Finance* 22.
- Cole, R.A., J.D. Wolken, and L.R. Woodburn, 1996, Bank and nonbank competition for small business credit:

Evidence from the 1987 and 1993 National Surveys of Small Business Finances, *Federal Reserve Bulletin*, 82, 983-95.

Craig, B.R., and J.C. dos Santos, 1997, Banking consolidation: Impact on small business lending, working paper, Federal Reserve Bank of Cleveland.

Demsetz, R.S., and P.E. Strahan, 1997, Diversification, size, and risk at bank holding companies, *Journal of Money, Credit, and Banking*, 29.

DeYoung, R., 1998, Comments on de novo banks and lending to small businesses, *Journal of Banking and Finance* 22.

Epstein, J.D., 1995, Years of bank mergers trigger a rise in start-ups looking for their niche, *American Banker*, December 27, 1, 6.

Goldberg, L.G. and L.J. White, 1998, De novo banks and lending to small businesses, *Journal of Banking and Finance* 22.

Hawawini, G. and I. Swary, 1990, Mergers and acquisitions in the U.S. banking industry: Evidence from the capital Markets (North-Holland, Amsterdam).

Houston, J.F., and C.M. James, 1995, Banking relationships, financial constraints and investment: Are bank dependent borrowers more financially constrained, University of Florida Working Paper.

Houston, J.F. and C.M. James, 1998, Do bank internal capital markets promote lending?, *Journal of Banking and Finance* 22.

Houston, J.F., and M.D. Ryngaert, 1994, The overall gains from large bank mergers, *Journal of Banking and Finance*, 18, 1155-76.

Hughes, J.P., W. Lang, L.J. Mester, C.G. Moon, Efficient banking under interstate branching, *Journal of Money, Credit and Banking*, 28, 1045-1071.

John, K., and E. Ofek, 1995, Asset sales and increase in focus, *Journal of Financial Economics* 37, 105-26.

Keeton, W.R., 1995, Multi-office bank lending to small businesses: Some new evidence, *Federal Reserve Bank of Kansas City Economic Review* 80 (2), 45-57.

- Keeton, W.R., 1996, Do bank mergers reduce lending to businesses and farmers? New evidence from Tenth District States, Federal Reserve Bank of Kansas City Economic Review 81 (3), 63-75.
- Keeton, W.R., 1997, The effects of mergers on farm and business lending at small banks: New evidence from Tenth District States," working paper, Federal Reserve Bank of Kansas City.
- Kolari, J., and A. Zardkoohi, 1997, The impact of structural change in the banking industry on small business lending, Report to the Small Business Administration (a).
- Kolari, J., and A. Zardkoohi, 1997, Bank acquisitions and small business lending, working paper, Texas A&M University (b).
- Kwast, M.L., M. Starr-McCluer, and J.D. Wolken, 1997, Market definition and the analysis of antitrust in banking, Antitrust Bulletin, 42.
- Levonian, M., and J. Soller, 1995, Small banks, small loans, small business, Federal Reserve Bank of San Francisco working paper.
- Palia, D., 1993, The managerial, regulatory, and financial determinants of bank merger premiums, Journal of Industrial Economics, 41, 91-102.
- Palia, D., 1994, Recent evidence on bank mergers, Financial Markets, Institutions, & Instruments, 3, 36-59.
- Pilloff, S.J., 1996, Performance changes and shareholder wealth creation associated with mergers of publicly traded banking institutions, Journal of Money, Credit, and Banking, 28, 294-310.
- Peek, J., and E.S. Rosengren, 1996, Small business credit availability: How important is size of lender? edited by A. Saunders and I. Walter, Financial system design: The case for universal banking, Burr Ridge, IL, Irwin.
- Peek, J., and E.S. Rosengren, 1998, Bank consolidation and small business lending: It's not just bank size that matters, Journal of Banking and Finance 22.
- Petersen, M.A. and R.G. Rajan, 1994, The benefits of firm-creditor relationships: Evidence from small business data, Journal of Finance 49, 3-37.
- Petersen, M.A. and R.G. Rajan, 1995, The effect of credit market competition on lending relationships, Quarterly Journal of Economics 110, 407-443.

- Strahan, P. E., and J. Weston, 1996, Small business lending and bank consolidation: Is there cause for concern? *Current Issues in Economics and Finance* 2, Federal Reserve Bank of New York.
- Strahan, P. E., and J. Weston, 1998, Small business lending and the changing structure of the banking industry, *Journal of Banking and Finance* 22.
- Toevs, A., 1992, Under what circumstances do bank mergers improve efficiency? *Proceedings of a conference on Bank Structure and Competition*, Federal Reserve Bank of Chicago, Chicago IL, 602-28.
- Walraven, N. 1997, Small business lending by banks involved in mergers, *Finance and Economics Discussion Series* 97-25, Board of Governors of the Federal Reserve.
- Williamson, O., 1967, The economics of defense contracting: Incentives and performance, in *Issues in Defense Economics*, ed. R. McKean. New York: Columbia University Press.
- Williamson, O., 1988, Corporate Finance and Corporate Governance, *Journal of Finance* 43, 567-91.
- Zardkoohi, and J. Kolari, 1997, The effect of structural changes in the U.S. banking industry on small business lending, working paper, Texas A&M University.

Table 1

Definitions and Sample Means of Variables Employed in the Analysis
 (All financial values are in 1000's of constant 1994 dollars.)

<u>Variable</u>	<u>Definition</u>	<u>Sample Means</u>	
		<u>STBL Banks</u>	<u>All Banks</u>
A. <u>Loan Proportions</u>			
P ₁	Proportion of gross total assets (GTA) lent to 'small' businesses with below \$1 million in bank credit.	.075	—
P ₂	Proportion of GTA lent to 'medium' businesses with \$1 million to \$25 million in bank credit.	.060	—
P ₃	Proportion of GTA lent to 'large' businesses with over \$25 million in bank credit.	.018	—
B. <u>Bank and Organization Size Variables (BANK AND ORG SIZE)</u>			
LNGTA	Log of bank gross total assets (GTA).	13.528	10.958
SMALLBANK	Dummy, equals one if bank has GTA < \$100 million.	.250	.741
MEDBANK	Dummy, equals one if \$100 million ≤ GTA < \$1 billion.	.281	.230
LARGEBANK	Dummy, equals one if \$1 billion ≤ GTA < \$10 billion.	.353	.025
HUGEBANK	Dummy, equals one if GTA ≥ \$10 billion.	.116	.004
LNORGGTA, SMALLORG, MEDORG, LARGEORG, HUGEORG	Same as BANK SIZE variables, except defined over all the banking assets in the organization (independent bank or top-tier holding company).		
C. <u>Bank and Organization Financial Variables (BANK AND ORG FINANCIAL)</u>			
EQRAT	Bank equity to GTA ratio.	.071	.087
LLRRAT	Bank loan loss reserve to total loan ratio.	.018	.015
OREORAT	Bank Other Real Estate Owned to total loan ratio.	.008	.009
NPFRAT	Bank nonperforming loans to total loan ratio.	.030	.029
PFRAT	Purchased funds to GTA ratio.	.251	.136
ORGEQRAT, ORGLLRRAT, ORGOREORAT, ORGNPFRAT, ORGPFRAT	Same as BANK FINANCIAL variables, except defined for the organization.		
D. <u>Local Market Competitive Position Variables (COMP POSITION)</u>			
BANKHERF	Herfindahl index for local (MSA or non-MSA county).	.204	.234
BANKSHARE	Bank's share of market deposits.	.194	.154
ORGHERF, ORGSHARE	Same, except over the organization.		

<u>Variable</u>	<u>Definition</u>	<u>STBL Banks</u>	<u>All Banks</u>
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E. Organizational Complexity Variables (ORG COMPLEXITY)

BHCOWNED	Dummy, equals one if bank is in a bank holding company.	.831	.593
MULTILEVELBHC	Dummy, equals one if there are multiple levels of BHC.	.141	.057
PUBLICLYTRADED	Dummy, equals one if top-tier BHC is SEC-registered.	.606	.222
OUT-OF-STATE	Dummy, equals one if top-tier BHC is in another state.	.136	.045

F. Past Merger and Acquisition Variables (PAST M&A)
(Means shown only for the first lag)

MERGEDk	Dummy, equals one if bank survived one or more mergers k years ago, k=1,2,3.	.100	.017
MERGEDk-EQ	Dummy, equals one if survived 'mergers of equals.'	.012	.005
MERGEDk-FAM	Dummy, equals one if survived 'family mergers.'	.045	.007
ACQUIREDk	Dummy, equals one if bank was acquired (i.e., changed top-tier BHC) k years ago, k=1,2,3.	.038	.028
ACQUIREDk-EQ	Dummy, equals one if acquired by an 'equal.'	.012	.006
ACQUIREDk-OUT	Dummy, equals one if acquired by an out-of-state BHC.	.017	.007
PURCHk	Dummy, equals one if top-tier BHC acquired other banks.	.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		
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G. Time Variables (TIME)

YEART	Dummies, equal one if the lending takes place in year t. All year dummies (1980-95) are included, and no intercept is specified.		
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H. Environmental Variables (ENVIRONMENT)

INMSA	Dummy, equals one if the bank is in an MSA	.698	.433
STATES	Dummy variable, equals one if the bank is in State s, for all all U.S. states and D.C. except the base case of California.		
FED, FDIC, OCC	Dummies for primary federal regulator (OCC excluded as base case).		

See the working paper for more details and data sources.

Table 2
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 Lending Proportions	Static Effect	Secular Change	Restructuring Effect	Direct Effect	Final Lending Proportions	Total Static, Restructuring plus Direct Effects ^b
All Mergers							
Number of banks	6,369	-3,861	n.a.	n.a.	n.a.	2,508	
Gross total assets (billions)	4852.4	n.a.	365.5	31.1	n.a.	5249.0	
Lending proportions to borrowers with bank credit:							
Less than \$1 million	0.03702	-0.00533**	-0.00879**	0.00067**	0.00049*	0.02416	-0.00416**
\$1 million - \$25 million	0.08641	0.00337**	0.00160**	-0.00205**	-0.00097**	0.08856	0.00035
Greater than \$25 million	0.05918	0.01442**	0.00709**	-0.00153**	-0.01006**	0.06857	0.00283*
Total	0.18261	0.01246**	-0.00010	-0.00291**	-0.01054**	0.18129	-0.00098
All Acquisitions							
Number of banks	1,116	n.a.	n.a.	n.a.	n.a.	4,146	
Gross total assets (billions)	1100.0	n.a.	106.0	52.9	n.a.	1258.9	
Lending proportions to borrowers with bank credit:							
Less than \$1 million	0.06054	-0.00638**	-0.01396**	0.00032**	0.00616**	0.04659	0.00011
\$1 million - \$25 million	0.08565	0.00267**	0.00236**	0.00004	0.00579**	0.09631	0.00851**
Greater than \$25 million	0.05229	0.02660**	-0.00088	-0.00276**	-0.01343**	0.06199	0.01041**
Total	0.19848	0.02289**	-0.01248**	-0.00240**	-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 7.

n.a. Not all of the effects change the number of banks or their gross total assets.

* Significantly different from zero at the 5% level, two-tailed.

** Significantly different from zero at the 1% level, two-tailed.

Table 3
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 Lending Proportions	Static Effect	Secular Change	Restructuring Effect	Direct Effect	Final Lending Proportions	Total Static, Restructuring plus Direct Effects ^b
All Mergers							
Number of banks	7,916	-4,810	n.a.	n.a.	n.a.	3,106	
Gross total assets (billions)	6253.1	n.a.	321.7	-117.2	n.a.	6457.6	
Lending proportions to borrowers with bank credit:							
Less than \$1 million	0.03324	-0.00417**	-0.00398**	0.00066**	0.00271**	0.02879	-0.00081*
\$1 million - \$25 million	0.08738	0.00509**	-0.00134**	-0.00014**	0.01261**	0.10401	0.01756**
Greater than \$25 million	0.05691	0.01165**	0.01063**	-0.00085**	-0.01035**	0.06829	0.00045
Total	0.17753	0.01257**	0.00531**	-0.00033	0.00497**	0.20109	0.01720**
All Acquisitions							
Number of banks	4,714	n.a.	n.a.	n.a.	n.a.	4,714	
Gross total assets (billions)	1276.5	n.a.	57.4	25.2	n.a.	1359.1	
Lending proportions to borrowers with bank credit:							
Less than \$1 million	0.05723	-0.00614**	-0.00694**	-0.00005	0.00715**	0.05117	0.00096*
\$1 million - \$25 million	0.08686	0.00052	0.00040	-0.00082**	-0.00284**	0.08390	-0.00314**
Greater than \$25 million	0.05621	0.03135**	0.00467**	0.00258**	-0.02769**	0.06747	0.00624**
Total	0.20031	0.02574**	-0.00186*	0.00171**	-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 7.

n.a. Not all of the effects change the number of banks or their gross total assets.

* Significantly different from zero at the 5% level, two-tailed.

** Significantly different from zero at the 1% level, two-tailed.

Table 4

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 5

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

Size of Survivor	Mergers		
	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**
Size of Acquirer Organization	Acquisitions		
	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 6
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 7
Total Magnitudes of the Effects of M&A Activity
On Aggregate Domestic C&I Lending^{ab}
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 F&I bank in the country not just those engaging in M&A activity.