The Dynamics of Market Entry: The Effects of Mergers and Acquisitions on De Novo Entry and Small Business Lending in the Banking Industry

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Abstract

We study the dynamics of market entry following mergers and acquisitions (M&As), and the behavior of recent entrants in supplying output that might be withdrawn by the consolidating firms. The data, drawn from the banking industry, suggest that M&As are associated with subsequent increases in the probability of entry. The estimates suggest that M&As explain more than 20% of entry in metropolitan markets, and more than 10% of entry in rural markets. Additional results suggest that bank age has a strong negative effect on the small business lending of small banks, but that M&As have little influence on this lending.

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I. Introduction

Entry, or the credible threat of entry, is important in many aspects of industrial organization, from theory to empirical research to institutional practice. All of these aspects share a concern that participants in concentrated markets may not behave in a competitive, efficient fashion that keeps goods and services available to consumers at prices close to marginal costs unless there is active market entry or a credible threat of entry. The theory has generated a number of factors that should be important to market entry, the empirical literature has tested some of these hypothesized factors, and antitrust authorities have weighed these factors in their approval/denial processes.

However, the literature is largely missing dynamic analyses of market entry. The theories and tests to date have primarily focused on factors such as profitability, concentration, and growth of the market, which may proxy for the prospects of future abnormal profits and invite entry. There has been little dynamic analysis of entry in response to the activities of the incumbent market participants, and in particular, there has been little analysis of the effects of mergers and acquisitions (M&As) on entry. This may be surprising, given the important role that M&As play in changing the structure and competitive conditions in a market, and the role that the prospects for future entry in response to M&As plays in antitrust analysis.

The issue of entry into local banking markets in response to bank M&As is a critical policy issue as well as an interesting research question. Whether or not there is new entry after consolidation activity has important implications for antitrust policy, for the efficiency of banking markets, and for the adequate supply of funds to small business borrowers. There are a number of studies of entry into local banking markets that use conventional explanatory variables, such as profits, concentration, growth, etc. However, only one study of which we are aware examines entry in response to M&As, and it finds the unexpected result that bank consolidation tends to **reduce** the probability of entry into local banking markets (Seelig and Critchfield 1999). As will be seen, we find substantially different results.

There is also little prior evidence on the effects of entry on customer service. If M&As result in fewer customers being served or a deterioration in service quality, an important question is whether entry makes up for these losses. If new entry replaces any lost output/service quality after M&As, then vigorous antitrust policy may not be as important as would otherwise be the case. Although the entry literature has investigated the conditions under which firms enter the market, the literature has generally not examined the

output of these firms to determine whether they are taking up the slack from noncompetitive behavior, or whether their output depends in a dynamic way on recent M&A activity.

In this research, we address both of these issues. First, we build a dynamic empirical model of entry into local banking markets that includes M&A activity and other market factors. Second, we model the small business lending output provided by the new entrants as a function of M&A activity and the other market factors, as well as variables measuring the size and condition of the bank itself. Thus, we not only model the entry process, but we measure the extent to which entry helps supply the output that may be withdrawn by firms engaging in consolidation activity.

The commercial banking industry provides an almost ideal laboratory for analyzing these issues. First, banks produce relatively homogeneous products in a large number of geographically segmented markets of various sizes, with different M&A experiences, and other variations in market structure and economic conditions. We examine entry activity in over 2,700 local banking markets — Metropolitan Statistical Areas (MSAs) or non-MSA counties across the U.S. — during a period of 19 years from 1980-1998, for a total of over 52,000 market-year observations of whether entry occurs, and almost 4,000 actual market entries. We are able to trace the effects of over 10,000 bank M&As over the time period and to distinguish among types of consolidation. This contrasts well with most other studies of entry, which typically have many fewer observations, often use 4-digit SIC categories that represent much more heterogenous products and services, and generally do not have information on M&A activity.

The use of banking markets also allows us to examine the effects of differences in barriers to entry created by regulatory restrictions. Over our sample period, a number of states had unit banking laws and other regulations that restricted the ability of incumbent firms from other markets from entering local banking markets. We hypothesize that these legal restrictions on competition would increase de novo entry by creating local market power and limiting the ability of existing banks outside the local market to enter by opening branch offices. That is, barriers to one type of entry (branching by existing banks in other markets) may create incentives and opportunities for another type of entry (de novo entry by banks with new charters).

Our analysis also addresses directly several important policy issues in banking. It has been found that some types of M&As tend to reduce small business lending by the M&A participants. This could be

because of organizational diseconomies from serving relationship-based small business borrowers along with the large transactions-based customers that large banks specialize in serving. The reduction in services to small customers may also result in part from the increased investment opportunities to serve large customers afforded by larger bank size, which "crowds out" small business loans in the use of increasingly costly funds. A reduction in services provided to small customers might also result in part from short-term disruptions caused by the consolidation process that gives other banks opportunities to take away customers who perceive a reduction in service quality or availability. The press often reports substantial customer runoffs after an M&A.

Consistent with these arguments and observations, some research has suggested a substantial positive external effect of M&As on the small business lending of other banks in the local market. However, there is little prior evidence on the extent to which this external effect was the result of established, mature banks increasing their small business lending versus new entry and/or additional lending by recent entrants. We address this issue by examining the probability of entry and the small business lending output of recent entrants as functions of local market M&As.

The remainder of the paper is organized as follows. Section 2 gives some facts about de novo entry that are of interest and that help guide the empirical analysis. Section 3 briefly reviews some of the relevant empirical literature on entry in general and in the banking industry. Section 4 describes the empirical literature on the effects of bank M&As that may help determine the probability of entry and small business lending by recent entrants and other small banks. Section 5 discusses the hypotheses, methodology, and variables employed in the analysis. Sections 6 and 7 summarize the empirical results for the probability of entry and small business lending, respectively. Section 8 concludes.

2. Some facts about de novo entry

This section presents some statistics about de novo entry in U.S. banking and some of the factors that are associated with this entry. These data suggest some potentially important determinants of entry that are incorporated in our multivariate empirical analysis below.

Table 1 reports statistics on the annual frequency of de novo entry into local U.S. banking markets — defined as Metropolitan Statistical Areas (MSAs) or non-MSA counties — over the period 1980-1998.

As shown in the bottom row of the table, there were 52,598 total market years, or 19 years times an average of 2,768 local markets in each year.[1] The bottom row also shows that 50,383 times or 95.79% of the time there were no new commercial banks entering the market. Nonetheless, the remaining 4.21% of the time still represents a tremendous amount of entry, with 3,875 total entries or 7.37 entries per 100 local markets per year. Given that there is no entry the vast majority of the time, it is perhaps surprising that a number of markets had many entrants in the same year. On 124 separate occasions, there were 5 or more entries in the same market in the same year, with a maximum of 40 entries.

The data in Table 1 suggest that the size of the market is a strong determinant of the probability of entry and number of entrants. This is not surprising — a large market should have more of all structural changes, including entry, than a small market. The size classes are based on total deposits in the market, adjusted to be in constant 1994 dollars using the GDP deflator.[2] In the smallest two market size classes shown — local markets with less than $300 million in total bank deposits — there was only about a 1% - 2% probability of entry, and there were no cases of more than 2 entries in the same market in the same year. On average, these small markets had only about 1 to 2 entrants per 100 markets per year and had a total of only 537 entries or about 14% of all entries, despite having about 73% of the total market-years. By contrast, in our largest market size class of over $5 billion in deposits, entry occurred 51.32% of the time, with most cases of entry involving multiple entrants. In 8.92% of these market-years, there were 5 or more entrants. On average, these large markets had 158.28 entrants per 100 markets per year, or more than 1.5 entrants per market per year. The 2,094 entries in these large markets account for more than half of all 3,875 de novo entries, despite the fact that these large markets account for less than 3% of the total market years.

Tables 2 and 3 segment the data by metropolitan (MSA) versus rural (non-MSA) markets. Not surprisingly, almost all of the large markets are metropolitan. Of the 1,323 market years with deposits over

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[1]Although these market definitions are imperfect, there is considerable research evidence supporting these local geographic demarcations as the markets for retail banking products such as small business loans and retail deposits. Survey data indicate that small businesses and households almost always choose a local financial institution (Kwast, Starr-McCluer, and Wolken 1997), while corporate customers may shop for wholesale financial services in national or international markets.

[2]Market deposits are determined from the FDIC Summary of Deposits data, the only publicly available source of information about the location of banking offices within a state.

$5 billion, 1,321 are MSAs and only 2 are rural. Also not surprising, almost all of the small markets are rural. Of the 38,389 market years with deposits under $300 million, 38,372 are rural and only 17 are MSAs. In the middle size classes in which both metropolitan and rural markets are well represented, metropolitan markets appear to have substantially higher probabilities of entry and greater numbers of entrants per market. For example, in the $1 billion - $5 billion deposit class, MSAs had a probability of entry of 18.04% and an average of 23.72 entrants per 100 markets, whereas non-MSA markets had entry probability and entrants per 100 markets less than half — 7.89% and 9.65, respectively. Prior research often finds that metropolitan and rural banking markets differ in competitive conditions, and these data confirm the prior research.

Based on these findings, we conduct separate multivariate regression analyses for three subsets of the data — 1) large metropolitan markets (deposits > $5 billion); 2) small metropolitan markets (deposits ≤ $5 billion); and 3) rural markets of all sizes. This segmentation provides a better chance of disentangling the effects of M&As and other important variables from the effects of market size and market type, which are highly correlated with both entry and M&A activity. The large metropolitan markets have the advantage for our logit equations of having a sample average probability of entry well away from the boundaries of 0 and 1, which should help us differentiate among the hypotheses about M&A activity and other factors. However, the rural markets have the advantage of having many more observations.

Table 4 shows the frequency of entry by year and by whether or not there was any M&A activity in the local market in the past 3 years — i.e., by whether or not at least one local bank survived a merger of bank charters or was acquired by a different top-tier bank holding company (BHC) in the three prior years. As discussed above, we hypothesize that recent M&As in the local market increase the probability of entry, and the data in Table 4 strongly support this hypothesis. In every year of the sample, 1) the overwhelming majority of de novo entries were in markets with recent M&A activity; 2) the frequency of entry per market was much higher in markets with M&A activity; and 3) entries per 100 markets were many times higher in M&A markets than in non-M&A markets. Moreover, the ratios of entry activity in M&A markets to non-M&A markets appear to be increasing over time. To illustrate, in 1998, 1) M&A markets had 188 entries versus 2 entries in non-M&A markets; 2) M&A markets had entry 5.77% of the time versus 0.33% of the time in non-M&A markets, and 3) M&A markets had 8.68 entries per 100 markets versus 0.33 entries per

100 non-M&A markets. These results undoubtedly depend in part on market size, metropolitan verus rural location, profitability of the market, and other factors that are controlled for in our multivariate regressions. Nonetheless, the raw data are quite one-sided and fairly persuasive on their own.

Two other findings are apparent from Table 4. First, the proportion of markets with recent M&A activity has increased steadily over time, from less than 30% at the beginning of the period to over 75% at the end of the period. Second, there was substantially more entry in the U.S. banking industry in the 1980s than in the 1990s. There were over 200 entries in every year in the 1980s, with a high of 408 entries in 1984. There were also 3 other years in the 1980s (1982, 1983, and 1985) with over 300 entries. One reason for the high frequency of entry in the 1980s may be a liberalization of charter policy at that time. Beginning in 1980, the Office of the Comptroller of the Currency began to pay less attention to the community's "capacity" to support an additional bank in granting national bank charters, and this policy of allowing market competition to determine entry and exit has continued since then (see White 1992, Office of the Comptroller of the Currency 1995, DeYoung and Hasan 1998).

In contrast with the 1980s, there were fewer than 200 entries in every year of the 1990s (through 1998), including a low of just 48 entries in 1994. However, there was a substantial upswing over the period 1995-1998, with a local maximum of 190 entrants in 1998. The percent of markets with entry and the number of entries per 100 market years are generally lower in the 1990s as well.[3]

In our empirical analysis below, we report separate regressions for the full 1980-1998 period and for the recent upswing subperiod of 1995-1998, allowing all the model parameters to differ. The full time period has the advantage over the recent subperiod of having more observations. In addition, the full period covers a broad range of macroeconomic, interest rate, profitability, and bank regulatory conditions, as opposed to the sustained favorable macroeconomic conditions, low interest rates, high bank profitability, and reduced regulations of the recent subperiod. The tests of the effects of M&As on the probability of entry and other

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[3]Interestingly, the frequency of entry over time does not seem to correspond as well as might be expected with aggregate banking industry profitability. Profitability was generally falling during the mid-1980s, while entries were rising to their sample peaks. As well, the recent run of high profitability began in the early 1990s, with record profits being reached in 1993 and 1994, the years with the fewest entries. However, entries have increased in the 1995-1998 time interval as would be expected, given that strong aggregate profitability and other favorable conditions for the banking industry have continued.

hypotheses over the full 1980-1998 time period may be viewed as the average effects over the long term and many environmental conditions, which may be more appropriate tests of the economic hypotheses. However, the tests over the 1995-1998 subperiod may be more revealing about the conditions for entry currently and in the near future.

Table 5 shows entry statistics classified by state banking regulations each year.[4] Unit banking regulations generally allow only one full service office per bank. Banks in limited branching states can have multiple branches, but are restricted in some way (e.g., branches in only one county). Over our time period, state geographic regulations were substantially liberalized, moving some states from unit to limited or statewide branching and some states from limited branching status to statewide branching. By the end of 1991, the final unit banking regulations had been eliminated.

As discussed above, we hypothesize that the state restrictions on competition from existing firms outside the local market would create market power and increase de novo entry. In some cases, de novo entry might be newly chartered banks opened by bank holding companies (BHCs) with other banks in the same or nearby local markets as legal alternatives to branching where branching is prohibited. For example, several BHCs owned a number of individual banks in Texas in the 1980s, which was a unit banking state until 1987.

The data shown in Table 5 are only somewhat consistent with these predictions. During the 1980s, unit banking markets generally had higher percentages of entry and more entries per 100 markets than markets in limited branching states, but were not much different on average from markets in statewide branching states. Presumably, markets in statewide branching states had comparable statistics to unit banking states because statewide branching states tend to be those with relatively large markets (e.g., California). As noted above, nationwide there was more entry in every year of the 1980s than in every year of the 1990s, which also supports the favorable effect of unit banking restrictions on entry, given that there were substantial numbers of unit banking markets only in the 1980s. However, there is no evidence in this

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[4]To be consistent with our empirical analysis below, the state rules shown in Table 5 are those in effect as of December 31 of the prior year. This reduces endogeneity problems and assures that the explanatory variables are known to those making the entry decisions.

table to support any favorable effect on entry of limited branching restrictions — limited branching markets generally had less entry than statewide branching states — although this may also partially reflect differences in market sizes. We deal with this further below in the multivariate regression analyses.

Some additional examination of the markets with entry in the most years and the most entries in a single year (not shown in tables) gives some further indications as to the importance of market size and restrictions on competition. Perhaps surprisingly, no market — not even New York with its overwhelming size — had entry every year. New York had entry in 18 of the 19 years, as did Denver and St. Louis. Eight MSAs with entry in 15 or 16 out of 19 years are Chicago, Los Angeles, Dallas, Houston, Atlanta, Kansas City, Phoenix, and Seattle. For the most part, these markets can be identified with large deposit size (New York, Chicago, Los Angeles), fairly restrictive state branching laws over most of the time period (Denver, St. Louis, Dallas, Houston, Kansas City), or high market growth (Atlanta, Phoenix, Seattle).

The single market year with the most entries, 40, was not one of the largest in size, but was Houston in 1983. The remainder of the 9 market-years with 21+ entries were Houston in 1984 (32 entries) and 1985 (25), Dallas in 1983 (25), 1984 (32), and 1985 (22), Denver in 1982 (25), and Los Angeles in 1982 (21) and 1983 (23). Houston, Dallas, and Denver in the early to mid-1980s were all in unit banking states, and this presumably reflects the state restrictions in Texas and Colorado. Los Angeles is presumably represented because of its market size (third largest market), high market growth in the early 1980s, and other factors. Note that all of these high entry cases occurred in the 1982-1985 time period, whereas during the recent 1995-1998 period, the maximum number of entrants in any one market in one year was 9.

A final set of findings not shown in the tables concerns de novo entry by thrift institutions (savings and loans and savings banks). For the main part of our analysis, we include only commercial bank entry, since thrifts typically do not compete effectively in the commercial loan market. As discussed earlier, the main policy questions we address about de novo entry in banking concern the effects of M&As on small business lending and the extent to which any external effect of M&As on the small business lending of other local banks operates through de novo entry and the lending of recent entrants. Thrift institutions typically devote an even smaller percentage of their assets to small business loans than do the very largest commercial banks, and so thrift entry generally is not a significant part of the external effect of M&As at issue here

(Kwan 1998). Nonetheless, we include thrift entry as a robustness check on our main results because many thrift products are substitutes for bank products and because the other study of the effects of M&As on entry included thrifts (Seelig and Critchfield 1999).

There were 743 thrift entries over our full time period of 1980-1998, about 20% as many as commercial bank entries. Many of the thrift entries occurred in the same markets in the same years as commercial bank entries, so the percent of market years with entry by commercial banks or thrifts was 4.65%, not much above the 4.21% of the time that one or more commercial banks entered. Importantly, the thrift entries do not alter the finding that entries occur much more often if there was bank M&A activity in the local market in the past 3 years. Over the 1995-1998 subperiod, M&A markets had 65 thrift entries versus 1 thrift entry in non-M&A markets. If anything, the thrift entry data are even more one-sided than the commercial bank entry data shown above in Table 4, strongly suggesting that M&A activity is associated with increased likelihood of entry.

3. Prior Evidence on Entry

In this section, we briefly review some of the relevant empirical literature on entry. We first discuss the evidence on entry in general, and then turn to evidence on entry in the banking industry. Section 4 reviews the empirical literature on the effects of bank M&As, which may help determine the probability of entry in the local banking markets.

The General Entry Literature

As noted above, theory predicts entry when there are strong prospects for future abnormal profits. The empirical literature has concentrated primarily on factors such as profitability, concentration, and growth to serve as proxies for expected future abnormal profits from entry into a market. The dynamic effects of M&As are generally not considered in the empirical literature, despite some good reasons to expect that consolidation may affect the supply of services and profitability of firms in the market.

The results in the empirical literature on entry do not provide as consistent a picture as does the theoretical literature. Siegfried and Evans (1994) summarized recent empirical work on entry across industries. They found that entry is positively related to industry profitability and to industry growth (see also Yip 1982, Deutsche 1984, Acs and Audretsch 1990, Chappel, Kimenyi, and Mayer 1990, Rosenbaum

1993). Earlier empirical research by Siegfried and Evans (1992) found that entry rates and exit rates are positively correlated. They interpreted exit, however, as firms' responses to declining prospects, as would occur when a firm is liquidated or when it is acquired by another firm after a string of losses. However, they do not address the possibility that M&As (as a form of exit) occur in good times as well as bad.

Another review of the entry literature by Geroski (1995) reported some additional findings and yielded somewhat different conclusions (see also Dunne, Roberts, and Samuelson 1988, Audretsch 1991, Baldwin and Gorecki 1991). Geroski (1995) found that de novo entry is common across industries, but entrants appear to have a short life span. The survival rate of entrants is low, and it takes more than a decade to achieve the size of the average incumbent when entrants do survive. Entry rates vary more within industries than across industries. Even though there is substantial entry, econometric estimates indicate that entry barriers are high. Entry reacts slowly to high profits, and it is difficult to estimate entry rates using measures of profitability and entry barriers.

Further, the ex post economic effects of entry do not follow theoretical expectations as closely as would be expected. Entry has only modest effects on average price-cost margins. Incumbent response to entry is selective. Pricing is not usually used to block entry, although marketing efforts are used for this purpose. Most of the literature has examined the short-run effects of entry rather than the long-term effects. Therefore, it is not too surprising to find that entry does not greatly affect profitability. Entry does appear to be highly correlated with high rates of innovation and increases in efficiency. Geroski (1995) concluded that active rivalry among existing firms in the market is preferable to entry since entry is often too slow, too small in scale, and too erratic to matter much. Although he welcomed the current antitrust emphasis on entry barriers as an important determinant of market structure, he argued that the pro-competitive effects of entry may be exaggerated.

There are distinct research advantages to examining regulated industries. The government mandates substantial data requirements of regulated firms. Also, many of these regulated markets are local, and the detailed data allow the researcher to segment the regulated industry into geographic markets, thus permitting more extensive analysis of the industry. Entry studies have been done on two regulated industries — airlines and banking.

For the airline industry, Joskow, Werden, and Johnson (1994) found that entry and exit have important competitive effects, contrary to the findings of the interindustry studies. Joskow, Werden, and Johnson (1994) found that though entry is generally not induced by above-normal price levels on a city-pair basis, entry reduces fares and increases output while exit increases fares and reduces output. In addition, in response to entry, incumbents cut price and maintain output, while in response to exit, survivors increase both price and output.

The findings from the general (nonbanking) literature as a whole cast doubt upon the ability of entry to restrain anticompetitive behavior and are consistent with a continued need for antitrust restraint on M&As. Essentially, the findings suggest that entry frequently does not occur when entry is needed to curb the exercise of market power. Moreover, although entry may "work" in terms of lowering prices when it does occur, the effect may be short-lived because of the low survival rate.

The Bank Entry Literature

The most relevant entry evidence for our study comes from research examining the banking industry. More detailed data are available for banking than for any other industry, and the results of these studies are more in line with theoretical models of market behavior. We focus on three recent studies here.[5]

Amel and Liang (1997) estimated a two-equation model of entry and profits for 1977-88. Their results support the existence of a competitive process in banking markets. New entrants are attracted by high profits, market size, and market growth.[6] Entry directly reduces market prices, especially in rural markets, and thus prevents super-competitive prices from persisting over time.

Moore and Skelton (1998) examined the paradox of the recent increase in de novo bank entry, given the decrease in the total number of banking organizations at the same time. Most of the analysis covers the year 1997. They found that de novo banks organize to take advantage of local conditions favoring entry such as high growth and deficiencies in the provision of certain services such as small business lending. The authors concluded that new banks have increased the level of competition in markets that needed more

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[5]See also Rhoades (1997) for an extensive discussion of the barriers to entry in banking.

[6]Amel and Liang defined entry by either de novo charters by new banks or new branch offices by existing banks from other markets. In contrast, we focus exclusively on de novo charters.

competitive behavior. Though multivariate analysis is not used by Moore and Skelton, their results support the notions that entry reacts to market forces and that entry has a competitive impact.

Finally, Seelig and Critchfield (1999) examined the determinants of entry in banking in MSAs over 1995-1997, expanding on the early work of Hanweck (1971), Rose (1977), and Rose and Savage (1983), who found that profitability and concentration are related to market entry. Seelig and Critchfield examined the hypothesis that merger activity encourages new entry because of negative market reaction to the merged larger banks. Their results not only reject the hypothesis that merger activity encourages the formation of de novo banks, but found a significant negative relationship between mergers and de novo entry. Our own empirical analysis is closest to that of Seelig and Critchfield, although we come to the opposite conclusion about the effects of M&A activity on entry.

4. Prior Evidence on the Effects of Bank M&As

Although there is very little direct empirical evidence on the effects of bank M&As on entry, there is substantial evidence on other effects of M&As that may influence entry decisions. There are at least three ways that M&As can affect the probability of de novo entry in the same local market. First, M&As may affect the exercise of market power in setting prices in the local market. The probability of entry should vary directly with the change in market power. Second, M&As may change the efficiency of the M&A participants or other local competitors. The probability of entry should vary inversely with the change in efficiency. More efficient incumbents are stronger competitors who may be expected to stay in business longer and be able to compete more effectively in pricing in the future. Third, M&As may affect the supply of services to small customers in the local market for reasons discussed below. The probability of entry should vary directly with the degree to which institutions participating in M&As reduce their supplies of services to small customers.[7]

The literature contains a number of static analyses of the effects of M&As, which examine the effects of changes in bank characteristics that are associated with M&As, such as the effects of increased size or market concentration. There are also a number of dynamic analyses, which compare the data for banks after

[7]For a detailed review of the consequences of bank M&As, see Berger, Demsetz, and Strahan (1999).

M&As with pre-M&A data or with data on other banks that have not recently engaged in M&As. Dynamic analyses take into account that M&As may involve long-term changes in organizational focus or managerial behavior and/or short-term costs or disruptions from consummating the M&A in addition to the static effects of changes in size, concentration, etc.

Bank M&As and Market Power

M&As between banks that have significant local market overlap ex ante may increase local market concentration and allow the consolidated bank and other banks in the local market to raise profits by setting prices less favorable to customers. This may affect rates and fees on small business loans and small deposits, as these products are typically competed for on a local basis. M&As of the market-extension type that join local banks with banks from outside the local market are less likely to increase local market power. The static literature on the effects of local market concentration generally found that banks in more concentrated markets charge higher rates on small business loans and pay lower rates on small deposits (e.g., Berger and Hannan 1989, 1997, Hannan 1991) and that their deposit rates were "sticky" or slow to respond to changes in open-market interest rates (Hannan and Berger 1991, Neumark and Sharpe 1992, Hannan 1994, Jackson 1997), consistent with market power.[8]

Dynamic studies of the effects of bank M&As on prices, which are based on prices actually charged before and after M&As, have mixed results as to the overall importance of M&As to the prices charged by M&A participants and their local market rivals (Akhavein, Berger, and Humphrey 1997, Prager and Hannan 1998, Sapienza 1998, Simons and Stavins 1998). However, one study that focused on in-market M&As with significant market overlap found strong effects on deposit prices (Prager and Hannan 1998). Thus, M&As — at least in-market M&As with substantial local market overlap — may boost the exercise of market power in pricing and increase the probability of entry.

There are reasons to expect that potential M&As that would result in large increases in concentration and market power do not actually occur. First, antitrust authorities often block, alter, or deter M&As that

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[8]It is possible that the exercise of market power in banking has declined in recent years due to the removal of geographic restrictions, the standardization of products, and expanded methods of delivery of services (see Radecki 1998, Berger, Demsetz, and Strahan 1999).

are expected to result in substantial increases in market power. Second, a theoretical model has been developed that shows that such M&As may also be deterred by the prospects of entry, which would raise output and/or lower prices so as to eliminate most of the private gains to these M&As (Werden and Froeb 1998).

Bank M&As and Efficiency

M&As may affect scale, scope, or product mix efficiency by moving the banks to a different output vector. M&As may also change X-efficiency if the consolidated bank alters its organizational focus or managerial behavior or suffers costs or disruptions from consummating the M&A. Banks may also improve their efficiency, broadly defined, by diversifying their portfolios and improving their risk-expected return tradeoffs.

Static studies of scale, scope, and product mix efficiencies using 1980s data generally suggest little or no cost efficiency improvement from the change in the output vector (e.g., Hunter and Timme 1986, Berger, Hanweck, and Humphrey 1987, Noulas, Ray, and Miller 1990), although recent research suggests that cost scale economies may have increased in the 1990s (e.g., Berger and Mester 1997). The size and geographic spread of interstate banking organizations also appears to have improved the risk-expected return tradeoffs for many of these banks, allowing them to increase lending and conserve on costly equity capital (e.g., Hughes, Lang, Mester, and Moon 1996, 1999, Demsetz and Strahan 1997). However, one study found that banks in markets with high concentration tend to have lower X-efficiency, all else held equal, possibly because managers of weakly controlled firms may take part of the benefits of the extra revenues from market power in pricing as reduced effort to maximize efficiency, or a "quiet life" (Berger and Hannan 1998). These results suggest that the effects of M&As on efficiency may depend in an important way upon whether the M&A is of the in-market type (which may increase market power and reduce efficiency), or of the market-extension type (which has little effect on market power, but may improve efficiency through diversification).

Dynamic studies of the X-efficiency effects of bank M&As generally have found very little or no cost efficiency improvement (e.g., Berger and Humphrey 1992, DeYoung 1997, Peristiani 1997, Rhoades 1998). However, studies of profit efficiency effects found that M&As improved profit efficiency, and that this improvement could be linked to improved diversification of risks (Akhavein, Berger, and Humphrey

1997, Berger 1998). After consolidation, the banks tend to shift their asset portfolios from securities to loans, to have more assets and loans per dollar of equity, and to raise additional uninsured purchased funds at reduced rates, consistent with a more diversified loan portfolio. In effect, capital market participants gave consolidated banks a benefit from diversification by allowing them to increase their lending without the penalty of more equity or higher rates on uninsured funds.

There is little information on the efficiency of de novo entrants, which is relevant to whether the entrants can compete with the firms engaging in M&As. One study found that de novo banks begin less profit efficient than mature banks of similar size, make up most of the difference within three years, and become equally efficient by about age nine (DeYoung and Hasan 1998). It seems unlikely that the entrants can match the geographic diversification advantages of banks that have engaged in market-extension M&As.

Bank M&As and Small Business Lending

Bank M&As may result in a reduction in the supply of credit to some small business borrowers as the consolidated banks at least partially exit from certain product niches of the market. This may occur because the larger, more organizationally complex banks created by M&As may encounter Williamson (1967, 1988) type organizational diseconomies associated with providing certain services to small business customers while engaging in their main business of providing services tailored to their large business customers. Large complex banks may withdraw from providing relationship-based small business loans because of diseconomies associated with providing these loans alongside their core business of delivering transactions-based loans, derivatives, other off-balance sheet guarantees, etc., to large business customers. That is, it may be too costly to provide relationship-based services, which often demand intimate knowledge of the small business, its owner, and its local market, together with the capital market financial services to large businesses in which large banks specialize.[9] The reduction in services to small, relationship-based

[9]A considerable amount of recent evidence supports the notion that banks use relationships to garner information about small businesses and that small businesses benefit from these relationships. U.S. small businesses with stronger banking relationships have been found to receive loans with lower rates and fewer collateral requirements, be less dependent on trade credit, enjoy greater credit availability, and have more protection against the interest rate cycle than other small businesses (e.g., Lang and Nakamura 1989, Petersen and Rajan 1994, 1995, Berger and Udell 1995, Blackwell and Winters 1997, Berlin and Mester 1998, Cole 1998, Hubbard, Kuttner, and Palia 1998). The data also suggest that banks gather valuable private information from depositors and in some cases use this information in credit decisions (Allen, Saunders, and

customers may also result in part from the increased investment opportunities afforded by larger bank size, including serving large, transactions-based customers. The improved alternatives may reduce investments in small business loans if the supply curve of funds to the bank is upward sloping, so that the marginal cost of funding small business loans increases with bank size. It is also possible that short-term disruptions caused by the consolidation process itself give other banks — either local incumbents or new entrants — the opportunity to "steal" customers who perceive a reduction in service quality or availability.

Supporting these arguments, static studies have found that larger banks devote lesser proportions of their assets to small business lending than smaller institutions (e.g., Berger, Kashyap, and Scalise 1995, Keeton 1995, Levonian and Soller 1995, Berger and Udell 1996, Peek and Rosengren 1996, Strahan and Weston 1996). As banks get larger, their proportions of assets devoted to small business lending (measured by domestic commercial and industrial loans to borrowers with bank credit less than $1 million) declines sharply from about 9% of assets for small banks (assets below $100 million) to less than 2% for very large banks (assets over $10 billion).[10]

A number of dynamic studies examined the effects of U.S. bank M&As on small business lending (e.g., Keeton 1996, 1997, Peek and Rosengren 1996, 1998, Strahan and Weston 1996, 1998, Craig and Santos 1997, Kolari and Zardkoohi 1997a,b, Zardkoohi and Kolari 1997, Walraven 1997, Berger, Saunders, Scalise, and Udell 1998). The most common findings are that M&As in which one or more of the banking organizations is large tend to reduce small business lending, whereas M&As between small organizations tend to increase small business lending, although there are exceptions. Since M&As involving large organizations dominate M&As in terms of assets, these studies suggest an aggregate net reduction in small business lending by the banks participating in M&As.

Udell 1991, Nakamura 1993, Mester, Nakamura, and Renault 1998).

[10]Some evidence also suggests that it is specifically relationship-dependent small borrowers that tend to receive less credit from large banks. One study found that large banks tend to charge about 1 percentage point less on small businesses loans and require collateral about 25% less often than small banks, other things equal (Berger and Udell 1996). These data suggest that large banks tend to issue small business loans to higher-quality transactions-based credits, rather than relationship-based loans that tend to have higher interest rates and collateral requirements. Similarly, another study found that large banks tend to base their small business loan approval decisions more on financial ratios, whereas the existence of a prior relationship with the borrowing firm mattered more to decisions by small banks (Cole, Goldberg, and White 1999).

Some research also measured an external effect that captures the dynamic responses to M&As of other lenders in the same local markets (Berger, Saunders, Scalise, and Udell 1998). The external effect incorporates the possibility that some loans that are dropped by the consolidating institutions may represent valuable business opportunities for other competitors or potential entrants. Although the external effect was not precisely measured, it appeared that the small business lending of other banks in the same local market tended to offset much, if not all of the negative effects on small business lending of M&As.

What is not known is the extent to which this external effect was the result of established banks' increasing their small business lending versus expansion by de novo entrants. As noted above, only one other study examined the effects of bank M&As on entry and found a negative effect, which suggests that entry may actually reduce the external effect of M&As. Nonetheless, some other evidence is consistent with the possibility of a strong external effect through entry. Several studies found that de novo banks tend to lend more to small businesses as a percentage of assets than other small banks of comparable size, and that this difference tends to persist for as long as 20 years after entry (DeYoung 1998, Goldberg and White 1998, DeYoung, Goldberg, and White 1999). One way that this might occur is that loan officers who leave the consolidated institution take some of their relationship-based loan portfolios with them and start a de novo bank. Unfortunately, none of these studies of lending by recent entrants included bank M&As as an explanatory variable, so it is difficult to determine whether this strong lending is part of an external effect of consolidation. As described in the next section, we try to extend the research on the external effects of M&As by investigating the effects of M&As on both the probability of entry and the small business lending of recent entrants.

5. Hypotheses and Methodology

In this section, we outline our main hypotheses to be tested and our empirical methodology for conducting the tests. The hypotheses concern factors that may affect the likelihood of de novo entry in a banking market and the small business lending of recent entrants and other small banks, and we develop empirical models of both entry and lending to test these hypotheses. For convenience, all of the variables used in the main entry regressions are described in detail in Table 6, along with the sample means and standard deviations of these variables for the large metropolitan, small metropolitan, and rural markets.

Similarly, the variables employed in the main small business lending regressions are shown in Table 7, along with the means and standard deviations of these variables for different age groups of small banks (GTA < $100 million). In the interest of brevity, variables used only in the robustness checks are not shown in the tables.

Hypotheses about Entry

The major hypotheses about the causes of entry concern the expected future profitability of a prospective entrant. We focus first on the expected future profit opportunities afforded by M&A activity in the local market. As indicated above, M&As may affect expected profitability from entry by 1) changing the exercise of market power in setting prices in the local market; 2) changing the efficiency of the M&A participants or other local competitors; and/or 3) altering the supply of services to small relationship-based customers in the local market, possibly creating external profitable opportunities to serve these customers.

Based on the evidence summarized above, the third effect of bank M&As on entry — the external effect from a possible reduction in the supply of services to small customers by banks engaging in M&As — is likely to be the strongest. Potential M&As that would result in large increases in market power likely do not occur often because of antitrust authorities and/or fear of entry or responses of other competitors. The only pronounced efficiency gains from bank M&As appear to be gains from increases in diversification, which would typically be expected to be strong only for market-extension type M&As. In contrast, the effect of M&As involving large banks in reducing small business lending is fairly well established, and this is the type of lending that is the niche of de novo banks for a number of years after entry. However, there is very little evidence directly connecting the external effect to de novo entry or to the lending of recent entrants.

There are a number of other influences on potential entrants' expectations of future profitability and hence on entry. Because those profit expectations are known only by the potential entrants, a number of proxies must be used. As indicated above, the literature often focuses on the recent profitability of incumbent firms, recent market growth, and the level of market concentration. Generally, profits, growth, and concentration are expected to have positive effects on the probability of entry, all else held equal, although concentration is sometimes thought to have a negative effect on the probability of entry because high concentration may be an indicator of high barriers to entry that are difficult to measure. We include

these variables in our empirical model of the probability of entry. We hypothesize that the effects of profitability and growth will be positive and that the effects of concentration will depend on whether it is more of a proxy for high profit opportunities or high entry barriers.'

We also include two variables which are similar in spirit to market growth. The market's ratio of purchased funds to total assets is included as an indicator of lending opportunities that exceed locally generated deposits. Similarly, the growth of income in the state is an indicator of future profitable opportunities for new banks, and is hypothesized to have a positive effect on the likelihood of de novo entry.

The entry literature also often includes various measures of barriers to entry. As discussed above, the state banking regulations such as unit banking rules act as barriers to entry by incumbent firms from other markets, but are not barriers to de novo entry. As shown in Table 6, we include a number of variables measuring these restrictions, including indicators of unit banking restrictions, limited branching restrictions, and recent changes in these restrictions. We hypothesize that legal restrictions on competition by existing banks increase the probability of de novo entry by creating local market power and limiting the ability of incumbent banks to enter. We also include a variable for whether BHCs from out of state may enter the market. However, the expected sign of the effect of this variable is ambiguous, since state laws differ and some of them affect both barriers to acquisitions by existing institutions and barriers to de novo entry.

We also include specific average market prices for major outputs (consumer loans, non-real estate business loans, real estate loans, and securities) and inputs (purchased funds, core deposits, and labor). We generally hypothesize that the probability of entry should be increasing in the output prices and decreasing in the input prices, all else held equal, as high output prices and low input prices are associated with profit making opportunities. However, because all but one of these prices are interest rates received by or paid by a bank, another plausible hypothesis is that the prices (other than labor) may reflect differences in risk across banking markets. High average market rates charged on loans could reflect high default premiums for lending to local customers and high rates paid by banks could reflect high relatively high bankruptcy probabilities for local banks. If these risks tend to deter entry, this could reverse the hypothesized signs on the outputs (e.g., high loan rates would reduce the probability of entry), but would reinforce the predicted signs on the funding inputs (e.g., high purchased funds rates would reduce the probability of entry both

because of low market power and high bankruptcy risk).

We also include a number of other factors shown in Table 6. We hypothesize that greater market shares of large or organizationally complex banks increase the probability of entry, as large or complex banks may be competitively disadvantaged in serving the small relationship customer niche in which de novo banks tend to specialize. We include variables measuring the efficiency and financial condition of market banks, given that more efficient or financially sound incumbents should make stronger competitors, which is likely to deter entry. However, it is also possible that better performing incumbents in a market is a proxy for favorable market conditions, which may encourage entry. Finally, as discussed earlier, we control for the size of the banking market and whether it is metropolitan or rural. As shown in Table 6, we group our explanatory variables into five broad categories: Market M&As; Other Competitive Conditions; Market Demand Conditions; Market Prices; and Condition of Market Banks.

Hypotheses about Small Business Lending

For our hypotheses about small business lending, we again focus on the expected effects of M&As, but also include a number of other hypotheses suggested by the literature. As discussed above, the theory and empirical evidence suggests that in most cases, bank M&As are likely to reduce relationship-based small business lending by the participants, which may create an external effect in which other existing banks or new entrants may have profitable opportunities to increase their lending by picking up some small business customers. In our empirical analysis, we examine the effects of M&As in a local market on small business lending by recent entrants and by other small banks of different ages. This allows a closer look at the external effect and the hypothesis that M&As increase small business lending by small banks as a whole. This also allows us to test the hypothesis that recent entrants react more to market M&As than other small banks, which may be the case if the purpose of entry was to react to lending opportunities created by M&As.

As discussed above, several studies found that de novo banks tend to lend more to small businesses as a percentage of assets than other small banks for as long as 20 years after entry (DeYoung 1998, Goldberg and White 1998, DeYoung, Goldberg, and White 1999). The raw data here support this negative effect of bank age on lending for small banks. As shown in Table 7, small banks that are young (ages 1-5 years) devote 17.9% of their assets to commercial and industrial (C&I) loans on average, compared to 14.0% for

adolescent small banks (ages 6-20 years), and 8.0% for mature small banks (21+ years). This is similar to the findings of the earlier studies. Some hypotheses that may explain this fact have not previously been explored. It may be the case that the external effect of M&As on small business lending is particularly strong for recent entrants, especially if the entry itself was part of the external effect of the M&As. Alternatively, recent entrants may behave about the same as other local small banks in terms of their lending reactions to M&As, but de novo entrants may be more highly represented in markets with recent M&As because M&As raise the probability of entry (consistent with our hypotheses about entry above). Our empirical analysis allows us to replicate the earlier research and test the hypothesis that recent entrants lend more than other banks of comparable size with a more comprehensive data set and more control variables than earlier research. We can also distinguish among the alternative hypotheses to explain this result by comparing the reactions to recent M&As of banks of different ages.

We also study the effects of the bank's own M&As differentiated by the age of the bank. This allows a first look at the effects of M&As in which recent entrants are participants. To date, there has been no analysis of which we are aware of the effects of M&As on the lending of participating banks of different ages. Thus, we can test the hypothesis for the first time that M&As involving recent entrants affect their lending differently from the effects of M&As on the lending of more mature small banks.

Most of our other hypotheses about the effects of market conditions on small business lending are essentially the same as our hypotheses described about the conditions that affect the likelihood of de novo entry. That is, factors that proxy for high profitability from entering a market generally are also associated with profitable lending opportunities and so should be associated with more small business lending by market participants. For example, we hypothesize that high values of market profits, growth, and other measures of market demand are likely to be associated with more small business lending, all else equal. In our empirical analysis, we include modified versions of all of the explanatory variables from the entry equations to allow all of these market conditions to affect lending.

We also test a number of other hypotheses related to the condition of the bank itself. The most important of these concern the age of the bank, given the previous empirical results and hypotheses about younger banks having more small business loans than other banks of comparable size. Based on the prior

research, we also test the hypotheses that banks that are larger or more organizationally complex devote smaller proportions of their assets to small business loans and that banks in worse financial condition (lower profits, lower equity capital, more nonperforming loans) also make fewer of these loans. We also include the bank's average market share (as well as the bank's average market concentration) to control for the effects of market power, which could result in either less or more small business lending.[11] As shown in Table 7, we group our explanatory variables into ten broad categories. The first five replicate the market variables used in the entry equations and described in Table 6, except that they are weighted averages over all the markets in which the bank operates. The last five categories are Bank's Age, Bank's Size; Bank's Ownership Structure; Bank's Financial Condition; and Bank's Market Share.

Methodology

We first model the probability of entry based on M&As in the market and other market variables hypothesized to affect the prospects for profitable entry. We estimate the model a number of different ways for several subsets of the data based on sample period, market size, and market type, but the main model is a simple logit equation of the probability of entry in market m in year t, which takes the form:

$$\ln(P(ENTRY)_{m,t}/(1-P(ENTRY)_{m,t})) = f(MARKET\ M\&A_{m,t-1,t-2,t-3}, OTHER\ COMPETITIVE\ CONDITIONS_{m,t-1}, MARKET\ DEMAND\ CONDITIONS_{m,t-1}, MARKET\ PRICES_{m,t-1}, CONDITION\ OF\ MARKET\ BANKS_{m,t-1}) + \varepsilon_{m,t}. \quad (1)$$

The data are annual, so that entry is measured as having occurred or not occurred during year t in market m. All of the right-hand-side variables are measured as of the end of year t-1 or earlier to reduce endogenous feedback effects. For expositional clarity, most of these explanatory variables shown in Table 6 have the prefix "MKT", indicating that these are calculated for the market. In most cases, these are averages over the banks which have deposits in the market weighted by each bank's share of these deposits. Other right-hand-side variables, such as the banking regulations, are for the state in which the market is located.

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[11]High market power may be associated with less small business lending because of higher prices charged for these loans. However, market power could alternatively result in more relationship lending by allowing the bank 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-than-competitive rate in a later period (Sharpe 1990, Petersen and Rajan 1995).

Because the prior research suggests that different types of M&As appear likely to have different market effects, we distinguish among the effects of different types of consolidation. As shown in Table 6, the MARKET M&A variables included in our main model measure the proportion of market deposits involved in recent bank mergers (MKT-MERGE), in which two or more bank charters are consolidated, and the proportion involved in BHC acquisitions (MKT-ACQUIS), in which the banks retain their separate charters but their BHC ownership is changed.[12] In our robustness checks, we also distinguish between in-market and market-extension mergers, mergers in which the pro forma consolidated bank is small versus large, and mergers between holding company affiliates versus mergers of previously unaffiliated banks.

We include 3 past years of M&As because prior analyses of bank M&As and reports by bank consultants suggest that at least 3 years are needed as a gestation period to complete any restructuring or refocusing of a bank after an M&A (e.g., Cornett and Tehranian 1992, Toevs 1992, Berger, Saunders, Scalise, and Udell 1998). The external effect on other banks in the local market and on new entry is likely to take at least as long as the effects on the institutions involved in the M&As, implying that a minimum of 3 years is necessary for the analysis. As well, 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). The main regressions we report specify the average over years t-1, t-2, and t-3 of the proportions of local market deposits in the offices of banks that were involved in mergers or acquisitions. As shown below, the results are robust with respect to an alternative specification in which the three individual annual lags are included.

In the interest of brevity, we will not discuss the other exogenous variables in the equation further here. The rationales for including these variables were given in the "Hypotheses about Entry" subsection above, and the individual descriptions and summary statistics on these variables are given in Table 6.

We next model the small business lending of de novo banks after entry based on the market variables relevant to the bank plus variables measuring the bank's own age, M&A experience, size, organizational complexity, financial condition, and market share. The dependent variable is in the form of a log-odds ratio

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[12]Note that our use of the proportions of market deposits in the offices of banks involved in M&A activity differs from the specification of Seelig and Critchfield (1999), who use unweighted numbers of M&As of banks in the market without respect to the market shares of banks involved.

of the proportion of assets devoted to commercial and industrial (C&I) lending. In effect, we are estimating the probability that a dollar of assets is devoted to small business lending, rather than other investments. For robustness, we also run the model with the log of the C&I lending ratio as the dependent variable and the results are materially unchanged. To be reasonably certain that the loans are to small businesses, we follow past research and include in these regressions only banks with gross total assets (GTA) below $100 million, as these banks typically are constrained by legal lending limits and problems of diversification from making large loans. The regression equation for the lending of bank i in market m in year t is of the form:[13]

$$\ln((C\&I/GTA)_{i,m,t}/(1-(C\&I/GTA)_{i,m,t})) = g\,(\text{MARKET M\&A}_{i,m,t-1,t-2,t-3},\ \text{OTHER COMPETITIVE CONDITIONS}_{i,m,t-1},\ \text{MARKET DEMAND CONDITIONS}_{i,m,t-1},\ \text{MARKET PRICES}_{i,m,t-1},\ \text{CONDITION OF MARKET BANKS}_{i,m,t-1},\ \text{BANK AGE}_{i,t-1},\ \text{BANK M\&A}_{i,t-1,t-2,t-3},\ \text{BANK SIZE}_{i,t-1},\ \text{BANK ORGANIZATIONAL COMPLEXITY}_{i,t-1},\ \text{BANK CONDITION}_{i,t-1},\ \text{BANK MARKET SHARE}_{i,t-1}) + \eta_{i,t}. \quad (2)$$

Equation (2) is estimated by weighted least squares in order to avoid heteroskedasticity problems and the adjusted R^2s are corrected.[14]

The dependent variable is based on the allocation of assets at the end of year t and all of the right-hand-side variables are measured as of the end of year t-1 or earlier to reduce endogenous feedback effects. As discussed above, we include modified versions of all of the right-hand-side variables from the entry equations, including market M&As, since variables that proxy for high profitability from entering a market also proxy for profitable lending opportunities and should be associated with more small business lending in the market. Since the lending equations refers to a bank rather than a market, we use weighted averages of the market variables in the markets m in which bank i has deposits, where the weights are the proportions of the bank's deposits that are in each market. The means of the weighted average market variables as shown

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[13]In the few cases where C&I/GTA were zero or close to it, we substituted the value .0001 for C&I/GTA to avoid having the dependent variable be at or close to $-\infty$. There were no observations of C&I/GTA equal to or near 1, so no adjustments were necessary on the upper end of the distribution.

[14]Each observation is divided by a number proportional to the estimated standard error of its error term $[\{(1/C\&I/GTA)_{i,m,t}) + [1/(1-C\&I/GTA)_{i,m,t})]\} / GTA_{i,m,t}]^{1/2}$.

in Table 7, which bear the prefix "WAM" differ from the corresponding variables with the prefix "MKT" shown in Table 6 because each observation of the variables summarized in Table 7 is for a bank, rather than for a market. The explanatory variables for the individual bank's age, M&A history, size, ownership structure, financial condition, and market share begin with the prefix "BANK," and are based on data for bank i as a whole.

Equation (2) is run two different ways. First, we include small banks (GTA < $100 million) of all ages, except for de novo entrants in their first year, since these banks do not have lagged values for the "BANK" variables. In this regression, we control for bank age with both a continuous variable (BANK-LNAGE) and with dummies for young banks (ages 1-5 years), adolescent banks (ages 6-20 years), and mature banks (21+ years). In the second form of equation (2), we run separate regressions for young, adolescent, and mature small banks. This allows us to compare the reactions to recent M&As of banks in different age groups and test whether the prior research results that young and adolescent banks (i.e., banks up to 20 years after entry) lend more than mature small banks might be explained by young and adolescent banks having larger reactions to market M&As.

6. Probability of Entry Results

Tables 8a and 8b show the results of the simple logit model of the probability of entry in equation (1). Table 8a applies the model to large metropolitan markets, small metropolitan markets, and rural markets for the full 1980-1998 period, and Table 8b repeats the exercise for the 1995-1998 subperiod.[15] The full time period has the advantage of more observations and coverage of a broad range of macroeconomic, interest rate, and bank regulatory conditions, whereas the more recent subperiod may be closer to the conditions for entry currently and in the near future. As discussed above, the effects over the full period may be viewed as the average effects over the long term and multiple environmental conditions, which may be more appropriate tests of the economic hypotheses.

The regressions shown in these tables exclude a small percentage of the observations, mostly because of missing or unreliable values of some of the variables. Importantly, we also eliminate large or unusual

[15]A small percentage of the observations, mostly from rural markets, are missing from the regressions due to missing or unreliable values of some of the variables.

types of de novo entries that could otherwise affect the results. We eliminate all entrants with GTA exceeding $1 billion by the end of the year, which may not fit our profile of small operators that may enter to provide services to small business customers. We also exclude commercial banks with bank types coded as subject to special analysis, such as bankers' banks, credit card banks with commercial bank charters, depository trust companies, and bridge entities. The means and standard deviations in Table 6 also reflect these exclusions.

The Effects of M&As on Entry

The data are strongly consistent with the hypothesis that M&As are associated with subsequent increases in the probability of entry into the markets in which the M&As occur. For the full 1980-1998 data set shown in Table 8a, the coefficients on the proportions of market deposits involved in recent bank mergers (MKT-MERGE) and in BHC acquisitions (MKT-ACQUIS) are positive and statistically significant at the 1% level in all three types of markets (large metropolitan, small metropolitan, and rural). For the recent subperiod 1995-1998 shown in Table 8b, the coefficients of MKT-MERGE and MKT-ACQUIS remain positive in all cases, but the degree of statistical significance is less. Four of the six parameters are significant at the 5% level, one is significant at the 10% level, and one coefficient (MKT-ACQUIS in the small metropolitan markets) is not statistically significant.

The drop in significance from the full sample to the 1995-1998 subsample is not surprising, given that most of the observations are excluded from the estimation. In addition, there is less variance in most of the economic conditions specified in the exogenous variable list during the subperiod, which makes accurate estimation more difficult.

The results of these logit equations also suggest that M&As have an **economically** significant impact as well as a statistically significant impact on the probability of de novo entry. One way to summarize the economic impact is to evaluate the predicted increase in entry probability from doubling the proportions of market deposits involved in recent M&As from their sample mean values. of the data used in the logit equations. Doubling the mean values for the full 1980-1998 data set of .181 for MKT-MERGE and .035 for MKT-ACQUIS for the large metropolitan markets and multiplying by the corresponding coefficients from the first column of Table 8a of 1.6196 and 5.1520, respectively, implies an increase in the predicted

probability of de novo entry from its mean of 51.7% to 63.2%.[16] This is an increase of 11.5 percentage points or 22.2%.[17] An alternative summary statistic for the effects of M&As is the decrease in predicted entry probability from the sample mean from eliminating M&A activity. Again using the sample means and parameter estimates for the large MSAs implies a decrease in the predicted probability of entry from its mean of 51.7% to 40.0%, a decline of 11.7 percentage points or 22.6%.[18] Put another way, M&As are estimated to be responsible for over one-fifth of observed de novo entry in large metropolitan markets. For small metropolitan markets, doubling the mean values of the M&A variables increases the predicted entry probability from its mean of 15.0% to 19.5%, an increase of 4.5 percentage points or 30.0%. Eliminating M&A activity in small metropolitan markets reduces the mean predicted probability from 15.0% to 11.4%, a decline of 3.6 percentage points or 24.0%. For rural markets, doubling M&As increases predicted entry probability from 1.8% to 2.0% (an 11.1% increase), and eliminating M&As reduces the predicted probability to 1.6% (an 11.1% decrease). These results suggest that at least part of the external effect of M&As found in prior research represents increased de novo entry, i.e., new lending by banks that previously did not exist.

Notably, the estimated parameters for the M&A variables in the logit equations using the 1995-1998 data subsample shown in Table 8b are generally larger than those for the full data set, and there is more M&A activity in this subperiod. Thus, the data from the shorter time period actually imply **greater** estimated economic significance, although with reduced statistical significance. Overall, the logit regressions suggest a strong, statistically significant and economically significant effect of M&As on entry, especially in metropolitan markets, where M&As are estimated to explain more than 20% of all de novo entry.

Robustness of the Findings on the Effects of M&As on Entry

To check robustness and assure confidence in our main findings about the effects of M&As on the

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[16]We base the economic significance evaluations on the sample mean value of the data used in the logit equations of 51.7%, as shown in Table 6, rather than the slightly different mean of 51.32% shown earlier. As noted above, the data used in the logit equations exclude some observations with missing or unreliable values of some of the variables and large or unusual types of de novo entries.

[17]Beginning at the mean probability of entry of .517, the effect of increasing MKT-MERGE by .181 and MKT-ACQUIS by .035 is calculated as raising the probability of entry to P_1 in the formula: $\ln(.517/(1-.517)) + (1.6196 \bullet .181) + (5.1520 \bullet .035) = \ln(P_1/(1-P_1))$.

[18]The formula for this probability is: $\ln(.517/(1-.517)) - (1.6196 \bullet .181) - (5.1520 \bullet .035) = \ln(P_2/(1-P_2))$.

likelihood of entry, we also run three series of robustness checks. The first series keeps the exogenous variable specification and data samples the same as in the main runs, but uses alternative econometric methods besides the logit model of entry versus no entry in equation (1). The second series uses the same econometric specifications and data samples as the main runs, but alters the specifications of the exogenous variables in various ways. The third series uses the main econometric specification and exogenous variables, but alters the data samples. To save space, the robustness results are summarized here, but are not shown in any tables.

The first alternative econometric method is a linear probability model of entry versus no entry. This yields similar results to the main model. For the full 1980-1998 sample, all six coefficients on the M&A variables (MKT-MERGE and MKT-ACQUIS) are positive, and 5 of them are statistically significant at the 1% level (MKT-MERGE is not significant in the rural markets regression). For the 1995-1998 subperiod, all six coefficients are again positive and five are significant, although the significance level is often lower, similar to the main results shown in Table 8b.

A Tobit model of entry and number of entries similarly supports the robustness of the main results. For the full sample, all six M&A coefficients are positive and statistically significant at the 10% level or better. For the 1995-1998 subperiod, five of the six parameters are positive and three of them significant at the 1% level. The one negative coefficient for this subperiod (MKT-MERGE in large metropolitan markets) is small and not statistically significant. Even in this case, the combined economic significance effect of doubling or eliminating all M&As still nets out to a strong positive effect of consolidation activity on the probability of entry.

We also run OLS on the number of entries two ways, once using the level (i.e., 0, 1, 2, ...) and once using the natural log of one plus the level (i.e., ln1, ln2, ln3, ...). In both cases, all M&A coefficients are positive for both the full sample and the 1995-1998 subperiod. For the full sample regressions, five of the six parameters are statistically significant, while three of six are significant for the recent subperiod.

We also run some ordered logit equations. These are similar to the main logit model of entry versus no entry, except that we use multiple categories of positive entry and force the slope coefficients to be identical. Using the information on multiple entries in Tables 1-3, for the rural and small metropolitan

markets, we specify 0, 1, and 2+ entries as the outcome categories and for the large metropolitan markets, we specify 0, 1, 2, 3, 4+ and alternatively, 0, 1, 2, 3, 4, 5, 6-10, 11-20, 21+ entries. The results are very similar to the main logit results in Tables 8a and 8b — all M&A coefficients are positive, all are statistically significant at the 1% level in the full 1980-1998 period, five of six are significant at some level in the 1995-1998 subperiod.

Turning next to our robustness checks that use alternative specifications of the exogenous variables, we first try distinguishing among more types of M&As. As noted above, we try distinguishing between in-market versus market-extension mergers, mergers in which the pro forma consolidated bank is small versus large, and mergers between holding company affiliates versus mergers of previously unaffiliated banks. To do so, we simply add variables to our main specification measuring the average over years t-1, t-2, and t-3 of the proportions of market deposits in the offices of banks that were involved in 1) in-market mergers, 2) mergers in which the pro forma bank had GTA < $100 million, and 3) mergers of banks in the same BHC. The original M&A variables MKT-MERGE and MKT-ACQUIS are also included, so the coefficients of these additional variables measure potential additional effects. The results are consistent with those in the main regressions — all six coefficients of MKT-MERGE and MKT-ACQUIS are positive and statistically significant for the full sample, all six are positive and five are significant for the 1995-1998 subsample. Only one of eighteen coefficients of the other M&A variables were statistically significant, suggesting that the addition of these variables does not alter our main results.

Next we try specifying the individual t-1, t-2, and t-3 lags of the main M&A variables instead of the three year averages (the additional M&A variables are not included). For the full sample, the coefficients of all eighteen lagged M&A variables are positive, and nine of them are statistically significant. For the recent subsample, fifteen of eighteen coefficients are positive, with seven of them significant. The three negatives are small and insignificant, and the averages of the lags of every M&A variable in every regression is positive.

We also rerun the main logit model adding in second-order terms on the continuous exogenous variables to allow for nonlinearities (e.g., ½ MKT-HERF^2). The result is no material change in the main results. The coefficients of all six M&A variables are positive and statistically significant for both the full

period and the 1995-1998 subperiod.

We also try rerunning the main model adding in time dummies for every year but one to allow for the possibility that our main results are driven by other factors that vary in an important way over time. Nonetheless, the main results are not materially changed. For the full sample, all six coefficients on the M&A variables are positive and statistically significant, and for the 1995-1998 subperiod, all six are also positive and five of the six are statistically significant.

We finally turn to our robustness checks that alter the data samples from our main specifications. First, we include thrift entry as well as commercial bank entry in the dependent variable, similar to Seelig and Critchfield (1999). As in the main results, we find that for the full sample, all six coefficients of the M&A variables are positive and statistically significant at the 1% level and for the 1995-1998 subsample, all six are positive and five of the six are statistically significant at some level. The coefficients are also of the same order of magnitude as in the main results.

We also try rerunning the main model using an alternative definitions of large, metropolitan markets that excludes the very largest markets with deposits over $50 billion, which may be quantitatively different from the banks with $5 billion to $50 billion.[19] No material difference is found — the coefficients of the M&A variables remain positive and statistically significant.

In sum, our statistically and economically significant positive relationship between M&As and the probability of de novo entry is quite robust. Three categories of robustness checks — alternative econometric methods, alternative specifications of the exogenous variables, and alternative data samples — all support our main results.

The Effects of Variables other than M&As on Entry

The estimated coefficients on the variables other than M&As in the probability-of-entry regressions in Tables 8a and 8b are mostly, but not always, consistent with the hypotheses given above. About half of the coefficients of these variables are statistically significant in the full 1980-1998 sample, but only about one-quarter are significant in the 1995-1998 subperiod, likely due to fewer observations and less variance

[19]The markets with over $50 billion are the New York, Chicago, and Los Angeles MSAs in every year and the San Francisco and Philadelphia MSAs in various years.

in the exogenous variables.

We hypothesized above that market profits, market growth in deposits, and related variables like the purchased funds ratio and the growth of state income should have positive effects on expected future profitability and the likelihood of de novo entry. The coefficients of the profitability variable MKT-ROE in Tables 8a and 8b are mixed — positive for the metropolitan markets, but negative for the rural markets — giving no clear effect of profitability on the likelihood of entry, once M&As and all the other factors are controlled for in the regressions. The coefficients of MKT-GROW are mostly negative and not statistically significant, but the coefficients of MKT-PFRAT and STGROW are all positive and are mostly statistically significant, giving support for the importance of some of the factors that are similar to growth, but not supporting the growth of the market itself as predicting more entry after controlling for these other factors.

We also predicted that concentration may have a positive effect on the probability of entry if it proxies mostly for profit opportunities from market power and a negative impact if it proxies mostly for high entry barriers. The coefficients of MKT-HERF are of mixed signs and are not statistically significant, except for a significant positive effect in rural markets for the full sample. Thus, neither effect appears to dominate overall.

We hypothesized that state banking regulations that create barriers to entry by incumbent firms from other markets may increase the probability of entry. The coefficients of UNITB are positive, statistically significant, and larger than the LIMITB coefficients for the full time period, consistent with the hypothesis (UNITB is excluded from the 1995-1998 subperiod, see notes to Table 8b). The coefficients of LIMITB are positive and significant for rural markets in both time periods, also consistent with the hypothesis. However, the LIMITB coefficients have mixed signs and are not significant for the metropolitan markets, presumably because limited branching laws typically allow unlimited branching within counties and mostly keep large banks based in metropolitan counties from branching elsewhere. States with newly liberalized branching rules (NEWLIB) have positive coefficients, suggesting that part or all of the effect of moving from unit or limited to statewide branching status or from limited to statewide branching is offset in the initial year of liberalization. Interstate BHC access (INTST), which has an ambiguous predicted effect as discussed above, has mixed coefficients and one significant negative coefficient for the full sample (excluded or unreliable

for the 1995-1998, see Table 8b notes).

According to our hypotheses, the probability of entry may be positively or negatively related to the output prices, depending on whether high rates proxy more for profitable opportunities (positive) versus high default risks (negative). The results are somewhat mixed, with the prices of consumer loans (P1) and non-real estate business loans (P2) generally being positively related to the probability of entry and the price of real estate loans (P3) being negatively and statistically significantly related to the probability of entry for the full sample period. These results suggest that while market power in pricing loans may encourage entry in some cases, a high price of real estate loans more likely signals high default probabilities in the market that may deter future bank entry. The input prices (W1, W2, W3) generally have either positive or insignificant coefficients, rather than the negative hypothesized signs.

We hypothesized that greater market shares of large or organizationally complex banks increase the probability of entry, but the data are only half consistent with this. The regressions in Tables 8a and 8b suggest that a greater presence of large banks discourages entry, contrary to expectations, while a greater presence of complexly organized banks (owned by out-of-state or multi-layered BHCs) encourages entry, consistent with expectations.

We hypothesized that more efficient or financially sound incumbents may make stronger competitors and deter entry. Again, the data are mixed. High equity capital (MKT-EQRAT) is associated with less entry in small metropolitan and rural markets as predicted. However, the coefficients of efficiency (MKT-EFFIC) are usually positive and not significant and the coefficients of nonperforming loans (MKT-NPL) are generally negative and significant in the later time period, contrary to the prediction. As discussed above, it is also possible that better performing incumbents in a market is a proxy for favorable market conditions which encourage entry, which may explain these last results.

Finally, we hypothesized that larger markets and metropolitan markets had more entry. Our main controls for these are in setting up the separate regressions for the large metropolitan, small metropolitan, and rural data subsets. Within these regressions, the log of market bank deposits (MKT-LNDEP) always has a positive, statistically significant coefficient, consistent with expectations. The additional size class dummies have negative, insignificant coefficients, suggesting that our combination of dividing the data into

subsets plus including MKT-LNDEP was sufficient to account for most of the important effects of market size on the probability of entry. Overall, the logit regression results shown in Tables 8a and 8b are strongly consistent with positive effects of M&As and market size, but most of the other hypotheses receive only mixed support.

7. Small Business Lending Results

Tables 9a and 9b show the results of the small business lending model in equation (2) for the full 1980-1998 period and the 1995-1998 subperiod, respectively. As a reminder, our small business lending analysis includes only small banks (GTA < $100 million) to be reasonably certain that the loans are to small businesses. The first columns of each table show regressions which include all small banks ages 1 and over (banks younger than 1 year do not have the required lagged values of the BANK variables and are excluded from the lending analysis). The different ages of banks are accounted for by the inclusion of the BANK-LNAGE, BANK-YOUNG, and BANK-ADOLES variables. These first regressions test for the effects of M&As, bank age, and other variables on small business lending, assuming that the effects of M&As and other variables are the same for banks of all ages. The remaining columns show regressions which allow the effects of M&As and all of the other slope coefficients to differ by age groups. We run separate regressions for young small banks (ages 1-5 years), adolescent small banks (ages 6-20 years), and mature small banks (21+ years) to test whether banks of different ages respond to M&As and other factors differently.[20]

The Effects of Market M&As on Small Business Lending

In contrast to the probability-of-entry results, the small business lending results do **not** consistently support an external effect of M&As that operates through any increased lending of recent de novo entrants. For the first regression with banks of all ages shown in Table 9a, the coefficient on WAM-MERGE is positive and statistically significant. However, this appears to reflect primarily a positive external effect of mergers on the small business lending of mature small banks, which constitute the majority of the data sample. In the separate equations by age group, the coefficient of WAM-MERGE is positive and significant

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[20]We do not run the lending regressions separately along metropolitan versus rural market lines or on the basis of market size, since individual banks typically lend in multiple types of markets, and we do not have separate data on the location of their loans. However, as shown below, we run a robustness check based on whether the bank is headquartered in an MSA or non-MSA county.

for mature small banks, but is negative and significant for young small banks, and negative and not significant for adolescent small banks. The coefficients of WAM-ACQUIS are negative in all cases and statistically significant except in the young small banks regression, contrary to expectations. However, the **economic** significance of these effects is relatively small. For example, doubling the proportions of market deposits involved in recent M&As from their sample mean values decreases the predicted proportion of small business lending by young small banks by about 2.5%, and eliminating M&A activity implies a predicted increase in the C&I lending proportion by these banks of about 2.5%.

Thus, the full sample results for the effects of market M&As do not support the hypothesis that there is a positive effect of consolidation on the small business lending of small banks in the market and in particular, do not support a positive effect for the most recent entrants. These data also suggest that exposure to market M&As does not explain the observed greater small business lending of recent entrants, although we present more direct evidence on this point below.

Interestingly, the results appear to turn around somewhat for the recent 1995-1998 subperiod. As shown in Table 9b, the coefficients of WAM-MERGE and WAM-ACQUIS are positive all eight cases, and are statistically significant positive in four of these cases. It may be the case that the hypothesized external effect has appeared more in recent years or that some other factor about the recent economic boom is related to M&As and small business lending. Nonetheless, the estimated economic magnitudes again suggest that the impact of M&As on small business lending by recent entrants is likely to be relatively small, on the order of about a 4% change in small business lending by young small banks from doubling or eliminating market M&A activity.

The Effects of Bank Age on Small Business Lending

We hypothesized above that market M&As may be responsible in whole or in part for the observed higher small business lending ratios for young and adolescent small banks versus mature small banks. This may occur because 1) recent entrants may have stronger external reactions to M&As or because 2) recent entrants are more often in markets with high M&A activity. The results already reviewed suggest that young small banks do not have an estimated positive external effect in the full sample and only a small, statistically insignificant effect in the 1995-1998 subsample, so the first potential explanation is not supported by the

data. Here we look at the measured effects of bank age on small business lending after controlling for M&As in the regression equations shown in Tables 9a and 9b. If either or both potential explanations are correct and M&As tend to explain the higher lending of young and adolescent small banks, then there should be little or no effects of the age variables BANK-LNAGE, BANK-YOUNG, and BANK-ADOLES remaining in these regressions that control for M&As.

The results shown in the first regression in Table 9a strongly suggest that as banks age, their small business lending ratio decreases even after controlling for the effects of market M&As and all of the other market- and bank-specific variables in the equation. The coefficients of BANK-YOUNG and BANK-ADOLES are both positive and statistically significant at the 1% level, suggesting that banks aged 20 or under have higher C&I/GTA ratios than other banks, all else equal. In addition, the coefficient of BANK-LNAGE is negative and significant at the 1% level, suggesting that even within age categories, younger banks have higher small business lending ratios after controlling for M&As and the other exogenous variables. Similarly, the coefficients of BANK-LNAGE are negative and significant at the 1% level in all three of the regressions by age group in Table 9a. In Table 9b, the coefficients of BANK-YOUNG, BANK-ADOLES, and BANK-LNAGE have the same signs in all six cases as in Table 9a, suggesting negative effects of bank age on lending, although the statistical significance is generally reduced or eliminated. These results strongly suggest that controlling for the presence of market M&As does not eliminate the observed relationship between age and small business lending.

To evaluate the **economic** significance of age differences by group, we use the coefficients in the first regressions in Tables 9a and 9b that include banks of all ages. To compare young small banks with mature small banks, we begin at the mean C&I/GTA ratio for young small banks of .179, remove the estimated effect of the BANK-YOUNG dummy, and add in the estimated effect of moving BANK-LNAGE from its mean value for young small banks of 1.176 (3.241 years old) to its mean for mature small banks of 4.294 (73.259 years old). Using the full sample estimated coefficients of .1514 for the BANK-YOUNG dummy and -.1791 for the LNAGE variable implies a decrease in the predicted proportion of small business

lending from 17.9% to 9.7%, a decrease of 8.2 percentage points or 45.9%.[21] Thus, even after controlling for M&As and all the other exogenous variables, the age variables alone bring the predicted C&I/GTA ratio most of the way down to the 8.0% mean value for the mature small banks shown in Table 7.

To compare adolescent small banks with mature small banks, we use the mean C&I/GTA ratio for adolescent small banks of .140, the estimated coefficient of the BANK-ADOLES dummy of .0588, and move BANK-LNAGE from its mean value for adolescents of 2.410 (11.134 years old) to the mature small banks mean. This implies a decrease in the predicted proportion of small business lending from 14.0% to 9.9%, a decrease of 4.1 percentage points or 29.5%. Again, the age variables alone bring the predicted lending ratio most of the way down to the 8.0% mean value for the mature small banks.

Using the full sample means, but applying the coefficients from the 1995-1998 subperiod yields somewhat smaller predicted changes, but again, the age variables alone explain most of the difference in mean lending ratios. For young small banks, the C&I/GTA ratio is predicted to move from 17.9% to 11.4% as banks become fully mature, a decrease of 35.8%, and for adolescent small banks, the ratio is predicted to move from 14.0% to 10.8%, a decrease of 22.9%.

Overall, these results suggest that M&A activity was **not** the driving force behind the finding in earlier studies and here that recent de novo entrants and other young banks tend to do more small business lending than other small banks. The data do not support a strong positive external effect of consolidation activity on the small business lending of young banks — the estimated effect is either small negative (full sample) or small positive (1995-1998 subperiod). In addition, the effects of age on lending remain statistically and economically significant after controlling for M&As and the other exogenous variables. The estimated magnitudes suggest that market M&As are not responsible for the observed high ratios of small business lending ratios of young and adolescent small banks.

Robustness of the Findings on the Effects of Market M&As and Bank Age on Small Business Lending

We also run several robustness checks to verify and confirm our findings about the effects of market M&As and bank age on small business lending by small banks. Most of these checks are analogous to the

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[21]The formula for the predicted small business lending proportion from increasing the age of the bank P_3 is given by: $\ln(.179/(1-.179)) + .1514 + ((4.294 - 1.176) \bullet (-.1791)) = \ln(P_3/(1-P_3))$.

checks on the probability-of-entry regressions that alter the specifications of the exogenous variables in various ways.

As above, we try alternative specifications of the M&A variables. We again distinguish between in-market versus market-extension mergers, mergers in which the pro forma consolidated bank is small versus large, and mergers between holding company affiliates versus mergers of previously unaffiliated banks. The main results concerning the effects of market M&As and bank age are consistent with those in the main regressions shown in Tables 9a and 9b. The measured effects of M&As on lending are mixed for the banks of all ages together (positive effects of WAM-MERGE and negative effect of WAM-ACQUIS), are either negative or small for young small banks, and are generally more positive during the 1995-1998 subperiod. The effects of bank age on small business lending are strongly negative and statistically significant, even after controlling for M&As and the other exogenous variables. The coefficients of the additional M&A variables are mostly statistically insignificant.

We again try specifying the individual t-1, t-2, and t-3 lags of the main M&A variables in place of the three year averages. Consistent with the main results, the measured positive effect of WAM-MERGE and negative effect of WAM-ACQUIS tend to offset each other for banks of all ages together, the effects of market M&As are either negative or small for young small banks, the external effects of M&As are generally more positive during the 1995-1998 subperiod, and the measured effects of bank age on small business lending are strongly negative and statistically significant.

We again rerun the main logit model adding in second-order terms on the continuous exogenous variables to allow for nonlinearities. The results are generally consistent with the main findings, except that the measured positive effect of WAM-MERGE in the regression for banks of all ages together is much smaller and not statistically significant.

We also rerun the lending model adding in the time dummies for individual years. The only important change is that the external effect actually becomes weaker. In the full sample with the banks of all ages together, the measured effect of WAM-MERGE becomes negative, although statistically insignificant, while the coefficient of WAM-ACQUIS continues to be negative and statistically significant. Again, the effects of market M&As are either negative or small for young small banks, the external effects

of M&As are generally more positive during the 1995-1998 subperiod, and the measured effects of bank age on small business lending are strongly negative and significant.

As a final robustness check, we run the lending model separately for banks headquartered in MSAs versus those headquartered in non-MSA counties, although this does **not** imply that all of the lending is either in metropolitan or rural markets. All of the findings with regard to market M&As and bank age are consistent with the main results, except that the external effect of M&As is even weaker in some cases (similar to our findings summarized just above for the time-dummies robustness check). In the full sample with all bank ages included for MSA-headquartered banks, the coefficients of both WAM-MERGE and WAM-ACQUIS are negative and statistically significant.

The Effects of Variables other than Market M&As and Bank Age on Small Business Lending

The estimated coefficients on the variables other than market M&As and bank age in the small business lending results of Tables 9a and 9b are only partly supportive of the hypotheses discussed above. As was true for the entry results of Tables 8a and 8b, more coefficients tend to be significant for the 1980-1998 sample than is true for the 1995-1998 subperiod.

We hypothesized that favorable market conditions for future bank profitability — such as high market profits, growth, purchased funds ratio, and state income growth — should also positively affect a bank's small business lending. The coefficients of WAM-ROE, WAM-GROW, WAM-PFRAT, and STINCOME are generally positive and often statistically significant, as expected, although the coefficients of WAM-PFRAT have reversed signs in some cases for the 1995-1998 subperiod.

The predicted consequences of market concentration and bank market share were uncertain, and their results are somewhat mixed. The coefficients of WAM-HERF are consistently positive and often significant, whereas the coefficients of BANK-SHARE are generally negative and often significant. Further, the market-level shares of large and of complex banks (WAM-SHAREL and WAM-SHAREC, respectively) appear to have mixed consequences for small business lending, depending on sample period and age of the banks.

With respect to some of the other market-level variables, the coefficients of WAM-MDEP1 and WAM-MDEP2 were generally positive and the coefficients of WAM-RDEP1 and WAM-RDEP2 were generally negative, indicating that small business lending tended to be greater in smaller metropolitan areas

and larger rural areas. Once these variables were controlled for, the presence of a bank in an MSA (the variable BANK-INMSA) had a mixed effect on small business lending. With respect to market output prices, the price of consumer loans (P1) is positively related to small business lending, while the prices of the other outputs were negatively related. The prices of inputs (W1, W2, W3) tend to have a positive effect on small business lending, rather than the negative effect that would be expected, although the price of core deposits (W2) has a negative effect for the 1995-1998 subperiod.

The effects of efficiency and financial soundness are somewhat mixed, similar to our earlier results. The coefficients of WAM-NPL are generally negative, consistent with unfavorable lending conditions deterring small business lending. However, the effects of WAM-EQRAT and WAM-EFFIC are also generally negative, suggesting that better capitalized and more efficient banks lend less, contrary to expectations.

With respect to bank-level variables, the coefficients of BANK-LNGTA are generally positive and often significant and the coefficients of the size class dummies BANK-SZU10, BANK-SZ1025, and BANK-SZ2550 are generally negative, suggesting that within the set of small banks, larger small banks tend to lend more. Related to this, the bank's own acquisitions (BANK-ACQUIS) tend to have a positive effect on small business lending (with significant coefficients for the full 1980-1998 period), but the bank's own mergers (BANK-MERGE) tends to be negative and significant for the full period or insignificant (for the 1995-1998 subperiod).

As for the bank's own complexity, we hypothesized that more complex banks should make fewer small business loans. This prediction is only partially supported. The coefficient of BANK-ONEBHC is consistently positive and significant (except for the young banks), apparently indicating that some modest complexity (or sophistication) may encourage small business lending. However, coefficients of BANK-MBHC are generally negative for the young and adolescent banks (which is consistent with the findings of DeYoung, Goldberg, and White 1999), the coefficients of BANK-OUTST and are consistently negative, while the coefficients of BANK-MUL_LAY are mixed.

With respect to the bank's profitability and financial strength, we hypothesized that a more profitable and financially strong bank would be expected to make more loans to small businesses. The results generally

do not support this position. The coefficients of BANK-ROE and BANK-EQRAT were mixed, while the coefficients of BANK-NPL were generally positive. Overall, the results shown in Tables 9a and 9b are only weakly supportive of the hypotheses discussed above, except for the strong results related to bank age.

8. Conclusions

We study the dynamics of market entry following mergers and acquisitions (M&As) by market incumbents and the behavior of recent entrants in supplying output that might be withdrawn by the firms engaging in consolidation activity. Our empirical application focuses on the commercial banking industry, which provides a superior laboratory for analyzing these dynamic effects of M&As because banks produce relatively homogeneous products in a large number of geographically segmented markets under different conditions. We are able to trace the effects of over 10,000 M&As in over 2,700 local banking markets during a period of 19 years, with over 52,000 market-year observations, and almost 4,000 actual market entries.

We are motivated in part by the lack of dynamic analysis in the general industrial organization, where M&As and other actions of incumbent firms are rarely considered in studies of market entry. We are also motivated by some significant policy and research questions relevant to the banking industry. The sensitivity of entry to M&A activity in local banking markets has important implications for antitrust policy, for banking market efficiency, and for the supply of credit to small business borrowers. Prior research found that some types of bank M&As tend to reduce the supply of small business credit by the consolidating banks, but that this reduction in supply may be offset in part or in full by an external effect in which other banks respond with increases in the supply of small business funds. However, there is little prior evidence suggesting the extent to which this external effect operates through increased de novo entry or additional lending by recent entrants. Additional research has found that recent entrants tend to lend much more to small businesses as a percent of assets than other small banks of comparable size for as long as 20 years after entry. But there is little prior evidence about the extent to which this additional lending represents reactions to M&As in the local markets of the recent entrants.

To address these issues, we estimate the probability of entry into local banking markets and the small business lending of recent de novo entrants and other small banks as functions of M&A activity in the local market and a number of other factors. Additional variables in these models include market concentration,

regulatory barriers to entry, and other competitive conditions; market growth and other demand conditions; market prices; and market profitability and other indicators of bank conditions. In the small business lending equations, we also take into account the bank's age, its own M&A activity, size, ownership structure, financial condition, and market share. Our main focus is on the effects of market M&As on the probability of entry and the small business lending of recent entrants, but we also try to explain the effects of bank age on small business lending and test a number of other hypotheses about factors that affect entry and lending.

The findings are strongly consistent with the hypothesis that M&As are associated with subsequent increases in the probability of entry into the markets in which the M&As occur. The coefficients of the M&A variables in the logit equations for the probability of entry into local banking markets are consistently positive and highly statistically significant across all types of markets for the full 1980-1998 data set, and are consistently positive and almost always statistically significant for the recent 1995-1998 subperiod. The results of these logit equations also suggest that M&As have an **economically** significant impact. The estimates suggest that M&As explain more than 20% of all de novo entry in metropolitan markets, and more than 10% of all de novo entry in rural markets. These results suggest that at least part of the external effect of M&As found in prior research — in which other local banks respond with increases in small business lending — operates through increased de novo entry, or lending by banks that did not exist prior to the M&As. We also run three series of robustness checks that 1) use alternative econometric methods; 2) change the specifications of the exogenous variables; or 3) alter the data samples. In all cases, the findings support our main result that M&As tend to increase the probability of de novo entry.

In contrast to the probability-of-entry results, the small business lending results do **not** consistently support an external effect of M&As that operates through any increased lending of recent de novo entrants. The measured effect of M&As on the lending of "young" small banks (ages 1-5 years) over the full 1980-1998 time period is negative, contrary to the hypothesized sign, although the magnitude is small, only about 2.5% of the lending of these firms. This result is reversed in the recent 1995-1998 subperiod, but again the magnitude is small.

Consistent with prior research, we find that bank age has a strong negative effect on the small business lending of small banks. The data strongly suggest that as banks age, their small business lending

ratio decreases even after controlling for the effects of market M&As and all of the other variables in the model. This result is both statistically and economically significant. For young small banks (ages 1-5), the model predicts a drop of about 45% in the ratio of small business loans to assets as the banks become mature (21+ years). The model similarly predicts a lending ratio drop of about 30% for "adolescent" small banks (ages 6-20) as they move to maturity. The findings suggest that market M&As are not responsible for the observed high ratios of small business lending ratios of young and adolescent small banks.

Most of the hypotheses concerning variables other than market M&As and bank age receive only mixed support. An exception is that market size is strongly positively related to the probability of de novo entry.

Finally, these findings have implications for policy and future research. With respect to policy, the result that the probability of entry increases substantially after the occurrence of local market M&As tends to support a continued role for prospective entry in antitrust analysis of M&A cases. The probability-of-entry result — combined with the finding that recent entrants tend to have higher ratios of small business loans to assets than do other banks — is consistent with an efficient response to market needs by prospective and recent entrants. In addition, these results imply an external effect of consolidation in which the small business lending that may be reduced by M&As may be partially replaced by new entrants. However, the finding that the lending of existing recent entrants does not appear to respond positively to M&As suggests that there is no additional "kick" to the external effect from a change in lending behavior by these young banks.

With respect to future research, the findings suggest that M&As and possibly other actions of incumbent firms should be included in future models of entry in both industrial organization and banking research. The results also suggest that effort be invested in evaluating a number of different external effects of M&As on the behavior of other market participants beyond what has been considered here. In addition to entry and output, the responses of other firms in terms of their prices, locations, and product mix could be included in future industrial organization research. In banking research in particular, the external effects of M&As on deposit and loan interest rates, quantities of other types of loans, geographical distributions of deposits, and quantity and location of bank branches could be further studied.

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Table 1

Frequency of Commercial Bank De Novo Entry by Size of Market (Annual Data 1980-1998)

ALL MARKETS

Market Size in deposits	Number of Entrants 0	1	2	3	4	5	6-10	11-20	21+	maximum # entrants	entrants/ 100 mkt years	total # entrants	total mkt years
<$100M	18319	152	3							2	0.86	158	18474
	99.16%	0.82%	0.02%										100.00%
$100-300M	19545	361	9							2	1.90	379	19915
	98.14%	1.81%	0.05%										100.00%
$300M-$1B	9067	377	40	3	1					4	4.95	470	9488
	95.56%	3.97%	0.42%	0.03%	0.01%								100.00%
$1-5B	2808	468	87	23	6	2	3	1		11	22.78	774	3398
	82.64%	13.77%	2.56%	0.68%	0.18%	0.06%	0.09%	0.03%					100.00%
>$5B	644	307	132	80	42	27	58	24	9	40	158.28	2094	1323
	48.68%	23.20%	9.98%	6.05%	3.17%	2.04%	4.38%	1.81%	0.68%				100.00%
TOTAL	50383	1665	271	106	49	29	61	25	9	40	7.37	3875	52598
	95.79%	3.17%	0.52%	0.20%	0.09%	0.06%	0.12%	0.05%	0.02%				100.00%

Notes: Banking markets are defined as Metropolitian Statistical Areas (MSAs) or non-MSA counties.

Table 2

Frequency of Commercial Bank De Novo Entry by Size of Market (Annual Data 1980-1998)

METROPOLITAN MARKETS

Market Size in deposits	Number of Entrants									maximum # entrants	entrants/ 100 mkt years	total # entrants	total mkt years
	0	1	2	3	4	5	6-10	11-20	21+				
<$100M	3									0	0.00	0	3
	100.00%												
$100-300M	12	2								1	14.29	2	14
	85.71%	14.29%											100.00%
$300M-$1B	1398	113	21	2						3	10.50	161	1534
	91.13%	7.37%	1.37%	0.13%									100.00%
$1-5B	2598	454	83	23	6	2	3	1		11	23.72	752	3170
	81.96%	14.32%	2.62%	0.73%	0.19%	0.06%	0.09%	0.03%					100.00%
>$5B	643	306	132	80	42	27	58	24	9	40	158.44	2093	1321
	48.68%	23.16%	9.99%	6.06%	3.18%	2.04%	4.39%	1.82%	0.68%				100.00%
TOTAL	4651	875	236	105	48	29	61	25	9	40	49.81	3008	6039
	77.02%	14.49%	3.91%	1.74%	0.79%	0.48%	1.01%	0.41%	0.15%				100.00%

Notes: Banking markets are defined as Metropolitian Statistical Areas (MSAs) or non-MSA counties.

Table 3

Frequency of Commercial Bank De Novo Entry by Size of Market (Annual Data 1980-1998)

RURAL MARKETS

Market Size in deposits	Number of Entrants 0	1	2	3	4	5	6-10	11-20	21+	maximum # entrants	entrants/ 100 mkt years	total # entrants	total mkt years
<$100M	18316	152	3							2	0.86	158	18471
	99.16%	0.82%	0.02%										100.00%
$100-300M	19533	359	9							2	1.89	377	19901
	98.15%	1.80%	0.05%										100.00%
$300M-$1B	7669	264	19	1	1					4	3.88	309	7954
	96.42%	3.32%	0.24%	0.01%	0.01%								100.00%
$1-5B	210	14	4							2	9.65	22	228
	92.11%	6.14%	1.75%										100.00%
>$5B	1	1								1	50.00	1	2
	50.00%	50.00%											100.00%
TOTAL	45729	790	35	1	1	0	0	0	0	4	1.86	866	46556
	98.22%	1.70%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%				100.00%

Notes: Banking markets are defined as Metropolitian Statistical Areas (MSAs) or non-MSA counties.

Table 4

Patterns of Commercial Bank De Novo Entry in Markets With and Without M&A Activity (Annual Data 1980-1998)

	ENTRY IN MARKETS WITH PRIOR M&A ACTIVITY				ENTRY IN MARKETS WITHOUT PRIOR M&A ACTIVITY				ENTRY IN ALL MARKTES			
YEAR	number of entrants	frequency of entry	entrants/ 100 markets	number of markets	number of entrants	frequency of entry	entrants/ 100 markets	number of markets	number of entrants	frequency of entry	entrants/ 100 markets	number of markets
1980	143	9.69%	19.51	733	70	3.11%	3.46	2025	213	4.86%	7.72	2758
1981	149	8.61%	18.06	825	61	2.63%	3.15	1937	210	4.42%	7.60	2762
1982	231	9.32%	25.33	912	90	4.11%	4.87	1849	321	5.83%	11.63	2761
1983	295	9.35%	28.72	1027	77	3.45%	4.43	1737	372	5.64%	13.46	2764
1984	326	9.11%	27.26	1196	82	3.95%	5.22	1570	408	6.18%	14.75	2766
1985	286	9.12%	21.92	1305	50	3.08%	3.42	1462	336	5.93%	12.14	2767
1986	233	7.56%	16.32	1428	26	1.93%	1.93	1344	259	4.83%	9.34	2772
1987	203	7.24%	13.36	1520	14	1.13%	1.13	1243	217	4.49%	7.85	2763
1988	221	7.27%	14.73	1500	17	1.35%	1.35	1256	238	4.57%	8.64	2756
1989	194	6.83%	12.75	1522	9	0.72%	0.72	1250	203	4.08%	7.32	2772
1990	159	6.56%	10.43	1524	11	0.88%	0.88	1247	170	4.01%	6.13	2771
1991	104	4.86%	6.32	1645	10	0.89%	0.89	1126	114	3.25%	4.11	2771
1992	73	3.36%	4.54	1609	6	0.52%	0.52	1162	79	2.17%	2.85	2771
1993	59	2.94%	3.62	1630	4	0.35%	0.35	1134	63	1.88%	2.28	2764
1994	44	2.35%	2.59	1702	4	0.37%	0.37	1075	48	1.58%	1.73	2777
1995	97	3.78%	5.02	1933	7	0.83%	0.83	844	104	2.88%	3.75	2777
1996	144	5.21%	7.08	2034	4	0.54%	0.54	743	148	3.96%	5.33	2777
1997	178	6.29%	8.48	2099	4	0.59%	0.59	677	182	4.90%	6.56	2776
1998	188	5.77%	8.68	2166	2	0.33%	0.33	607	190	4.58%	6.85	2773

Notes:
A market is considered to have prior M&A activity if in any of the previous three years, any bank in the market was involved in a merger (two or more bank charters were consolidated) or an acquisition (charter retained but change of bank holding company ownership).

Table 5
Patterns of Commercial Bank De Novo Entry by State Banking Regulations

	UNIT BANKING STATES				LIMITED BRANCHING STATES				STATEWIDE BRANCHING STATES			
YEAR	number of entrants	frequency of entry	entrants/ 100 markets	number of markets	number of entrants	frequency of entry	entrants/ 100 markets	number of markets	number of entrants	frequency of entry	entrants/ 100 markets	number of markets
1980	95	5.85%	9.92	958	62	3.93%	4.60	1347	56	6.65%	14.89	376
1981	99	5.08%	11.17	886	58	3.66%	4.08	1422	53	6.63%	14.06	377
1982	154	7.68%	17.40	885	97	4.73%	6.95	1396	70	6.72%	17.41	402
1983	201	9.09%	26.87	748	90	3.91%	5.87	1534	81	6.93%	20.05	404
1984	190	9.97%	32.09	592	141	4.52%	8.38	1682	77	8.70%	18.60	414
1985	142	8.26%	23.95	593	140	5.02%	8.37	1672	54	7.31%	12.74	424
1986	95	7.25%	16.02	593	118	3.86%	7.35	1606	46	5.89%	9.35	492
1987	40	4.06%	6.77	591	126	3.88%	7.88	1600	51	7.66%	10.28	496
1988	18	3.74%	8.41	214	163	4.66%	8.94	1824	57	5.16%	8.91	640
1989	17	4.19%	7.91	215	63	2.48%	4.46	1413	123	6.53%	11.64	1057
1990	19	4.19%	8.84	215	59	2.96%	4.60	1283	92	5.40%	7.76	1186
1991	2	3.51%	3.51	57	34	2.45%	3.21	1060	78	3.96%	4.98	1567
1992					25	1.97%	2.47	1014	54	2.40%	3.23	1670
1993					21	1.58%	2.07	1014	42	2.16%	2.52	1666
1994					13	1.29%	1.40	927	35	1.82%	1.99	1758
1995					23	2.16%	2.48	927	81	3.41%	4.61	1757
1996					47	3.88%	5.07	927	101	4.21%	5.75	1757
1997					52	4.32%	5.62	926	130	5.46%	7.40	1757
1998					34	2.88%	3.92	867	156	5.63%	8.61	1812

Notes:
Unit banking regulations generally allow only one full service office per bank.
Banks in limited branching states can have multiple branches, but these are restricted in some way (e.g., branches in only one county).

TABLE 6

Variables Employed in Entry Regressions

Symbol	Definition	Large MSAs Mean (Std. Dev.)	Small MSAs Mean (Std. Dev.)	Rural Markets Mean (Std. Dev.)
	Dependent Variables			
ENTRY	Dummy for positive entry.	0.517 (0.500	0.150 (0.358)	0.018 (0.135)
	Market Mergers and Acquisitions (M&A)			
MKT-MERGE	Share of local market deposits in banks involved in mergers in which two or more bank charters are consolidated, averaged over the previous three years.	0.181 (0.152)	0.136 (0.137)	0.068 (0.126)
MKT-ACQUIS	Share of local market deposits in banks involved in acquisitions in which the banks retain their separate charters but change their bank holding company ownership, averaged over the previous three years.	0.035 (0.049)	0.041 (0.062)	0.026 (0.064)
	Other Competitive Conditions			
MKT-HERF	Local market Herfindahl index.	0.153 (0.072)	0.201 (0.082)	0.422 (0.231)
MKT-SHAREL	Share of market deposits held by large banks (GTA > $100M).	0.658 (0.037)	0.852 0.142	0.397 (0.402)
MKT-SHAREC	Share of market deposits held by complex banks (owned by out-of-state or multilayered (BHC).	0.223 (0.187)	0.240 (0.272)	0.136 (0.247)
UNITB	Dummy variable indicating unit banking state.	0.062 (0.242)	0.092 (0.290)	0.134 (0.341)
LIMITB	Dummy variable indicating limited branching state (statewide branching dummy is excluded from the regressions as the base case).	0.362 (0.481)	0.431 (0.495)	0.488 (0.500)
NEWLIB	Dummy, equals 1 if the state moved to a more liberal branching rule this year.	0.042 (0.200)	0.046 (0.211)	0.045 (0.207)
INTST	Dummy variable indicating interstate bank holding company expansion is allowed.	0.69 (0.464)	0.599 (0.490)	0.578 (0.494)
	Market Demand Conditions			
MKT-GROW	Growth rate of market deposits.	0.035 (0.195)	0.022 (0.187)	0.035 (0.973)
STINCOME	Real state income growth.	0.033 (0.024)	0.031 (0.027)	0.030 (0.028)
MKT-PFRAT	Market average purchased funds/GTA ratio.	0.302 (0.111)	0.214 (0.088)	0.147 (0.081)

Symbol	Definition	Large MSAs Mean (Std. Dev.)	Small MSAs Mean (Std. Dev.)	Rural Markets Mean (Std. Dev.)
MKT-LNDEP	Market size (log of market deposits).	16.401 (0.732)	14.155 (0.637)	11.736 (0.976)
MKT-MDEP1	Size dummy, indicates metropolitan market < $1B in deposits (This variable is excluded as the base case in the 1995-1998 subperiod regressions).	- -	0.329 (0.470)	- -
MKT-MDEP2	Size dummy for metropolitan markets from $1B - $5B in deposits (This variable is excluded as the base case in the 1980-1998 full sample period regressions).	- -	0.671 (0.470)	- -
MKT-RDEP2	Size dummy, indicates rural market $100M-$300M in deposits. (Dummy for rural markets less than $100M is excluded as the base case in rural market regressions).	- -	- -	0.445 (0.497)
MKT-RDEP3	Size dummy for rural markets greater than $300M in deposits.	- -	- -	0.183 (0.387)
	Market Prices			
MKT-P1	Market average price of consumer loans (installment, credit cards, and related plans).	0.092 (0.036)	0.083 (0.048)	0.070 (0.061)
MKT-P2	Market average price of non-real estate business loans (commercial and industrial loans, agricultural loans, loans to depository institutions, etc.).	0.132 (0.087)	0.157 (0.098)	0.161 (0.087)
MKT-P3	Market average price of real estate loans.	0.076 (.028)	0.068 (0.037)	0.061 (0.052)
MKT-P4	Market average price of securities (all non-loan financial assets).	0.051 (0.012)	0.057 (0.014)	0.063 (0.016)
MKT-W1	Market average price of purchased funds (jumbo CDs, foreign deposits, federal funds purchased, all other liabilities except core deposits).	0.063 (0.024)	0.064 (0.025)	0.058 (0.024)
MKT-W2	Market average price of core deposits (domestic transactions accounts, time and savings).	0.034 (0.015)	0.040 (0.016)	0.046 (0.019)
MKT-W3	Market average price of labor (1000's of constant 1994 dollars per employee).	35.341 (6.879)	30.694 (9.987)	30.147 (5.414)
	Condition of Market Banks			
MKT-ROE	Return on equity average in market.	0.106 (0.105)	0.115 (0.092)	0.112 (0.113)
MKT-NPL	Market average nonperforming loan ratio.	0.030 (0.025)	0.025 (0.023)	0.029 (0.029)
MKT-EQRAT	Market average equity/GTA ratio.	0.067 (0.012)	0.074 (0.012)	0.087 (0.020)
MKT-EFFIC	Market average cost efficiency measure (the negative of the market average residual from Fourier flexible cost function).	0.004 (0.070)	-0.005 (0.075)	-0.012 (0.090)

Notes: All financial values are measured in real 1994 dollars using the GDP deflator.

TABLE 7

Variables Employed in Lending Regressions

For Small Banks (GTA < $100 Million)

Symbol	Definition	Young Small Banks (1-5 years) Mean (Std. Dev.)	Adolescent Small Banks (6-20 years) Mean (Std. Dev.)	Mature Small Banks (21+ years) Mean (Std. Dev.)
	Dependent Variable			
C&I/GTA	Commercial and industrial loans as a proportion of the bank's assets.	0.179 (0.109)	0.140 (0.093)	0.080 (0.055)
	Mergers and Acquisitions (M&As) in the Bank's Market(s)			
WAM-MERGE	Weighted average of the shares of market deposits in banks involved in mergers (in which two or more bank charters are consolidated, averaged over the previous three years), where the weights are the proportions of this bank's deposits in each market.	0.101 (0.129)	0.103 (0.137)	0.113 (0.129)
WAM-ACQUIS	Weighted average of the shares of market deposits in banks involved in acquisitions (in which the banks retain their separate charters but change their bank holding company ownership, averaged over the previous three years), where the weights are the proportions of this bank's deposits in each market.	0.038 (0.056)	0.035 (0.055)	0.029 (0.050)
	Other Competitive Conditions in Bank's Market(s)			
WAM-HERF	Weighted average of local market Herfindahl index.	0.185 (0.135)	0.200 (0.146)	0.265 (0.164)
WAM-SHAREL	Weighted average of shares of market deposits held by large banks (GTA > $100M).	0.747 (0.289)	0.673 (0.312)	0.418 (0.346)
WAM-SHAREC	Weighted average of shares of market deposits held by complex banks (owned by out-of-state or multilayered (BHC).	0.229 (0.243)	0.207 (0.253)	0.229 (0.247)
BANK-INMSA	Dummy, indicating that bank is headquartered in an MSA.	0.734 (0.442)	0.643 (0.479)	0.233 (0.423)
UNITB	Dummy variable indicating unit banking state.	0.272 (0.445)	0.224 (0.417)	0 (0)
LIMITB	Dummy variable indicating limited branching state (State-wide branching dummy is excluded from the regressions as the base case).	0.354 (0.478)	0.434 (0.496)	0.411 (0.492)
NEWLIB	Dummy, equals 1 if the state moved to a more liberal branching rule this year.	0.082 (0.278)	0.060 (0.243)	0.004 (0.066)
INTST	Dummy variable indicating interstate bank holding company expansion is allowed.	0.462 (0.499)	0.509 (0.500)	1.000 (0.012)

Symbol	Definition	Young Small Banks (1-5 years) Mean (Std. Dev.)	Adolescent Small Banks (6-20 years) Mean (Std. Dev.)	Mature Small Banks (21+ years) Mean (Std. Dev.)
	Demand Conditions in the Bank's Market(s)			
STINCOME	Real state income growth	0.029 (0.027)	0.301 (0.027)	0.045 (0.027)
WAM-GROW	Weighted average of growth rate of market deposits.	0.030 (0.169)	0.021 (0.171)	0.021 (0.142)
WAM-PFRAT	Weighted average of market average purchased funds/GTA ratio.	0.278 (0.129)	0.236 (0.121)	0.162 (0.072)
STINCOME	Real state income growth	0.029 (0.027)	0.301 (0.027)	0.045 (0.027)
WAM-LNDEP	Weighted average of market size (log of market deposits).	15.058 (2.085)	14.566 (2.146)	12.805 (1.662)
WAM-MDEP1	Proportion of bank's deposits in metropolitan markets < $1B.	0.046 (0.208)	0.055 (0.226)	0.019 (0.131)
WAM-MDEP2	Proportion of bank's deposits in metropolitan markets from $1B - $5B.	0.187 (0.389)	0.197 (0.394)	0.100 (0.292)
WAM-RDEP1	Proportion of bank's deposits in rural markets < $100M.	0.053 (0.223)	0.073 (0.256)	0.184 (0.379)
WAM-RDEP2	Proportion of bank's deposits in rural markets $100M - $300M.	0.112 (0.314)	0.164 (0.366)	0.421 (0.482)
WAM-RDEP3	Proportion of bank's deposits in rural markets greater than $300M.	0.099 (0.297)	0.118 (0.318)	0.179 (0.375)
	Prices in the Bank's Market(s)			
WAM-P1	Weighted average of market average price of consumer loans (installment and credit cards and related plans).	0.087 (0.035)	0.085 (0.036)	0.089 (0.023)
WAM-P2	Weighted average of market average price of non-real estate business loans (commercial and industrial loans, agricultural loans, loans to depository institutions, etc.).	0.156 (0.092)	0.169 (0.099)	0.104 (0.032)
WAM-P3	Weighted average of market average price of real estate loans.	0.0743 (0.026)	0.072 (0.025)	0.077 (0.012)
WAM-P4	Weighted average of market average price of securities (all non-loan financial assets).	0.057 (0.012)	0.058 (0.014)	0.047 (0.006)
WAM-W1	Weighted average of market average price of purchased funds (jumbo CDs, foreign deposits, federal funds purchased, all other liabilities except core deposits).	0.070 (0.022)	0.066 (0.025)	0.040 (0.008)
WAM-W2	Weighted average of market average price of core deposits (domestic transactions accounts, time and savings).	0.042 (0.015)	0.040 (0.017)	0.027 (0.007)

Symbol	Definition	Young Small Banks (1-5 years) Mean (Std. Dev.)	Adolescent Small Banks (6-20 years) Mean (Std. Dev.)	Mature Small Banks (21+ years) Mean (Std. Dev.)
WAM-W3	Weighted average of market average price of labor (1000's of constant 1994 dollars per employee).	32.797 (5.973)	32.026 (6.342)	33.506 (5.191)
	Condition of Banks in the Bank's Market(s)			
WAM-ROE	Weighted average of average ROE in markets.	0.069 (0.146)	0.101 (0.111)	0.133 (0.039)
WAM-NPL	Market nonperforming loan ratio.	0.036 (0.033)	0.028 (0.028)	0.024 (0.012)
WAM-EQRAT	Market average equity/GTA ratio.	0.069 (0.015)	0.074 (0.016)	0.094 (0.018)
WAM-EFFIC	Weighted average of market efficiency measure (the negative of the market average residual from Fourier flexible cost function).	-0.005 (0.062)	-0.007 (0.066)	-0.001 (0.078)
	Bank Age			
BANK-LNAGE	Log of bank's age, in years.	1.176 (0.345)	2.410 (0.371)	4.294 (0.421)
BANK-YOUNG	Dummy variable, indicating a young bank, age 1-5 years (banks younger than 1 year do not have the required lagged values of the BANK variables and are excluded from the lending analysis).	1.000 (0.000)	- -	- -
BANK-ADOLES	Dummy variable, indicating an adolescent bank, age 6-20 years.	- -	1.000 (0.000)	- -
BANK-MATURE	Dummy variable, indicating a mature bank, age 21+ years.	- -	- -	1.000 (0.000)
	Bank Mergers and Acquisitions (M&As)			
BANK-MERGE	Dummy variable, indicating that bank survived a merger.	0.010 (0.097)	0.011 (0.106)	0.023 (0.151)
BANK-ACQUIS	Dummy variable indicating that bank changed top-tier BHC	0.045 (0.207)	0.082 (0.274)	0.061 (0.239)
	Bank Size			
BANK-LNGTA	Log of gross total assets.	10.241 (0.647)	10.507 (0.611)	10.491 (0.662)
BANK-SZU10	Dummy variable indicating GTA < $10M.	0.065 (0.246)	0.027 (0.162)	0.039 (0.193)
BANK-SZ1025	Dummy variable indicating GTA $10M - $25M.	0.355 (0.479)	0.237 (0.425)	0.247 (0.431)
BANK-SZ2550	Dummy variable indicating GTA $25M - $50M.	0.373 (0.484)	0.389 (0.488)	0.355 (0.478)
SZ50100	Dummy variable indicating GTA $50M - $100M.	0.253 (0.435)	0.355 (0.479)	0.351 (0.477)

Symbol	Definition	Young Small Banks (1-5 years) Mean (Std. Dev.)	Adolescent Small Banks (6-20 years) Mean (Std. Dev.)	Mature Small Banks (21+ years) Mean (Std. Dev.)
	Bank's Ownership Structure			
BANK-ONEBHC	Dummy variable indicating that bank is member of a BHC.	0.192 (0.394)	0.298 (0.457)	0.521 (0.500)
BANK-MBHC	Dummy variable indicating that bank is member of a multi-bank BHC.	0.216 (0.412)	0.235 (0.424)	0.233 (0.423)
BANK-MUL_LAY	Dummy variable indicating that bank is member of a multi-layered BHC.	0.026 (0.159)	0.430 (0.203)	0.079 (0.270)
BANK-OUTST	Dummy variable indicating that bank is member of an out-of-state BHC.	0.0290 (0.168)	0.025 (0.156)	0.033 (0.179)
	Bank's Financial Condition			
BANK-ROE	Bank's return on equity.	-0.010 (0.349)	0.072 (0.251)	0.111 (0.064)
BANK-EQRAT	Bank's equity/GTA ratio.	0.107 (0.053)	0.081 (0.031)	0.105 (0.034)
BANK-NPL	Bank's nonperforming loan ratio.	0.027 (0.040)	0.029 (0.038)	0.028 (0.024)
	Bank's Market Share			
BANK-SHARE	Weighted average of bank's shares of local market deposits.	0.034 (0.080)	0.065 (0.121)	0.174 (0.206)

Table 8a
Logit Estimation of Probability of Commercial Bank De Novo Entry
Full Sample Period 1980-1998

	Large Metropolitan Markets		Small Metropolitan Markets		Rural Markets	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
INTERCEPT	-10.6576 ***	2.2223	-15.0134 ***	1.6273	-17.8439 ***	1.2874
MKT-MERGE	1.6196 ***	0.4754	1.6939 ***	0.3492	1.0037 ***	0.3132
MKT-ACQUIS	5.1520 ***	1.5103	2.1145 ***	0.7448	1.8296 ***	0.5175
MKT-HERF	-0.2346	0.8058	-0.1050	0.4821	1.4353 ***	0.2591
MKT-SHAREL	-6.7606 ***	1.3424	-1.3741 ***	0.4420	-0.2148	0.1535
MKT-SHAREC	0.6421 *	0.3297	0.4817 **	0.2007	0.7585 ***	0.1526
UNITB	1.5537 ***	0.5452	1.1217 ***	0.1855	1.3767 ***	0.1347
LIMITB	-0.2565	0.1612	0.0452	0.1175	0.4542 ***	0.1011
NEWLIB	1.0286 ***	0.3451	0.1452	0.2369	0.1562	0.2079
INTST	0.1822	0.2319	-0.1496	0.1585	-0.35 ***	0.1199
MKT-GROW	0.2522	0.3493	-0.1014	0.2301	-0.2447	0.1990
STINCOME	23.5777 ***	3.1415	13.1544 ***	1.7283	7.7188 ***	1.2105
MKT-PFRAT	3.1862 ***	0.9502	2.5616 ***	0.6252	2.8581 ***	0.4973
MKT-LNDEP	0.8842 ***	0.1194	0.9784 ***	0.1104	1.0433 ***	0.1057
MKT-MDEP1			-0.0874	0.1565		
MKT-RDEP2					-0.104	0.1490
MKT-RDEP3					-0.2352	0.2299
MKT-P1	3.7846	3.7339	7.0249 ***	2.2164	1.3733	1.2954
MKT-P2	1.4196	1.6419	2.6202 ***	0.9119	1.2439 **	0.5986
MKT-P3	-8.1778 *	4.5493	-7.9600 ***	2.6969	-3.126 **	1.4916
MKT-P4	2.4507	8.8961	-7.0684	5.1620	5.1978	4.0226
MKT-W1	2.2188	5.6042	3.0477	3.3577	1.0824	1.9667
MKT-W2	17.2020 **	8.4107	-1.8333	4.9403	-4.9823	3.6202
MKT-W3	-0.0156	0.0163	-0.0139	0.0127	0.00186	0.0081
MKT-ROE	0.1729	0.9036	1.4109 **	0.5632	-0.6341 ***	0.1813
MKT-NPL	-5.2705	4.8372	0.8775	3.2750	0.3613	1.7320
MKT-EQRAT	0.2618	7.3512	-12.7580 ***	4.6397	-7.3865 ***	2.6819
MKT-EFFIC	-0.9546	1.0558	-0.9081	0.6112	-0.3864	0.4748
Num. Obs.	1,316		4713		44,688	
Adjusted R^2	0.1775		0.1145		0.0938	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

The adjusted R^2 for the logit equations measures the proportion of the log-likelihood value explained by the model's non-intercept independent variables, i.e., 1 - (log L_{ALL})/(log L_{INT}), where L_{ALL} denotes the likelihood value of estimation with all the independent variables and L_{INT} denotes the likelihood value of estimation with only the intercept.

Table 8b
Logit Estimation of Probability of Commercial Bank De Novo Entry
1995-1998 Subperiod

	Large Metropolitan Markets		Small Metropolitan Markets		Rural Markets	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
INTERCEPT	-27.1742	999.5000	-14.9825 ***	3.6086	-35.7704	2464.5000
MKT-MERGE	2.1665 **	1.0184	1.6795 **	0.7561	1.5958 **	0.6438
MKT-ACQUIS	9.1977 **	4.3766	2.9420	1.8269	2.3612 *	1.3222
MKT-HERF	0.8971	1.6935	-0.5789	0.9095	0.4789	0.6414
MKT-SHAREL	-5.1351	4.2075	-0.7172	1.2665	0.5727	0.3870
MKT-SHAREC	0.6793	0.6325	0.9567 **	0.4081	0.2411	0.3318
LIMITB	-0.2540	0.4653	0.0718	0.2569	0.7905 ***	0.1805
NEWLIB	14.4321	2001.5000	1.2016	0.9877	0.4913	1.0736
INTST	12.8330	999.5000			14.1510	2464.5000
MKT-GROW	-1.3544	0.8530	-0.3977	0.4702	-0.7529	0.4984
STINCOME	10.3202 *	5.4646	0.0086	3.5894	4.3263	2.8703
MKT-PFRAT	1.3830	2.7699	1.8347	1.5800	-2.3646	1.5326
MKT-LNDEP	0.8804 ***	0.2381	0.9951 ***	0.2249	1.2026 ***	0.2314
MKT-MDEP2			-0.4031	0.3403		
MKT-RDEP2					-0.3093	0.3953
MKT-RDEP3					-0.3543	0.5654
MKT-P1	5.1105	7.8357	-0.7150	5.1883	4.5292	3.2088
MKT-P2	7.2283	8.6653	2.5399	3.9784	2.9588	2.4401
MKT-P3	-16.9345	20.6689	2.5208	13.5672	-1.2502	7.9498
MKT-P4	-2.7475	32.4448	-32.0857 **	15.5412	4.9674	14.6602
MKT-W1	5.8840	27.3222	-10.9362	17.5987	23.2010 *	12.4094
MKT-W2	23.4911	37.1263	69.3324	22.0750	-1.2586	16.2992
MKT-W3	0.0333	0.0391	0.0208 ***	0.0252	0.0185	0.0196
MKT-ROE	12.5356 **	5.5629	0.7141	1.0483	-1.6152	2.5831
MKT-NPL	-89.6090 ***	26.4133	-39.8364 **	17.0324	2.6316	8.3430
MKT-EQRAT	14.1192	20.5332	-15.5751	10.8050	-2.7056	6.4260
MKT-EFFIC	-1.3163	2.0023	-2.5587 **	1.0687	-2.0235 **	0.9941
Num. Obs.	303		969		9,407	
Adjusted R^2	0.1831		0.0847		0.1210	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

The adjusted R^2 for the logit equations measures the proportion of the log-likelihood value explained by the model's non-intercept independent variables, i.e., 1 - (log L_{ALL})/(log L_{INT}), where L_{ALL} denotes the likelihood value of estimation with all the independent variables and L_{INT} denotes the likelihood value of estimation with only the intercept.

Some missing or unusual coefficients and standard errors appear for some of the state banking regulation variables for the 1995-1998 subperiod because most of the deregulation occurred prior to 1995.

UNITB is excluded from these regressions because there were no unit banking states over this subperiod.

For large metropolitan markets, the variable NEWLIB takes the value 1 for only one of 303 market years, yielding a very large standard error.

The variable INTST takes the value 1 in almost all of the markets including all the small metropolitan markets, yielding an exclusion of this variable from one regression and large standard errors in the other two regressions.

Table 9a
Grouped Logit Estimation of C&I Lending
Full Sample Period 1980-1998

	Small Banks of All Ages		Young Small Banks (1-5 years)		Adolescent Small Banks (6-20 years)		Mature Small Banks (21+ years)	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
INTERCEP	-2.5502 ***	0.1107	-2.2263 ***	0.3897	-1.4334 ***	0.2605	-2.8746 ***	0.1305
WAM-MERGE	0.0532 ***	0.0175	-0.2943 ***	0.0600	-0.0511	0.0365	0.1630 ***	0.0225
WAM-ACQUIS	-0.2173 ***	0.0350	-0.0215	0.1287	-0.2060 **	0.0848	-0.1668 ***	0.0404
WAM-HERF	0.1566 ***	0.0232	0.4549 ***	0.1020	0.1549 **	0.0609	0.0996 ***	0.0257
WAM-SHAREL	-0.0116	0.0112	0.1137 *	0.0580	0.2261 ***	0.0332	-0.0546 ***	0.0119
WAM-SHAREC	0.0922 ***	0.0094	-0.0860 **	0.0338	0.0774 ***	0.0207	0.0912 ***	0.0116
BANK-INMSA	0.0081	0.0114	0.0888	0.0540	0.1299 ***	0.0286	-0.0229 *	0.0124
UNITB	0.1162 ***	0.0060	-0.0177	0.0225	0.0767 ***	0.0154	0.2166 ***	0.0069
LIMITB	0.0000	0.0044	-0.0043	0.0162	0.0287 **	0.0113	0.0452 ***	0.0051
NEWLIB	0.0209 ***	0.0072	0.0944 ***	0.0258	-0.0375 **	0.0181	0.0576 ***	0.0083
INTST	-0.1600 ***	0.0055	-0.1931 ***	0.0215	-0.2127 ***	0.0146	-0.1400 ***	0.0061
STINCOME	1.0925 ***	0.0637	0.3271	0.2798	0.4603 ***	0.1656	1.2562 ***	0.0700
WAM-GROW	0.0495 ***	0.0122	-0.0272	0.0433	0.0039	0.0248	0.1038 ***	0.0152
WAM-PFRAT	0.5325 ***	0.0251	0.0018	0.0914	0.1858 ***	0.0617	0.7562 ***	0.0301
WAM-LNDEP	-0.0021	0.0037	0.0285 **	0.0112	-0.0530 ***	0.0079	-0.0030	0.0049
WAM-MDEP1	0.0671 ***	0.0139	0.1657 ***	0.0450	-0.0353	0.0286	0.0842 ***	0.0182
WAM-MDEP2	0.0304 ***	0.0090	0.0157	0.0263	-0.0762 ***	0.0181	0.0838 ***	0.0122
WAM-RDEP1	-0.0393 *	0.0227	-0.0938	0.1007	-0.0707	0.0578	0.0369	0.0277
WAM-RDEP2	-0.0227	0.0194	-0.0297	0.0761	-0.0875 *	0.0452	0.0167	0.0242
WAM-RDEP3	0.0086	0.0173	0.0178	0.0652	-0.0429	0.0390	0.0502 **	0.0215
WAM-P1	0.5126 ***	0.0753	0.1481	0.3630	0.0865	0.1994	0.6628 ***	0.0817
WAM-P2	-0.3154 ***	0.0339	-0.7459 ***	0.1567	-1.1041 ***	0.0890	-0.0350	0.0369
WAM-P3	-2.4046 ***	0.1099	-1.3486 ***	0.5146	-3.0338 ***	0.3009	-2.1288 ***	0.1190
WAM-P4	-4.3826 ***	0.2078	-6.6556 ***	0.9076	-7.1054 ***	0.5387	-2.7556 ***	0.2278
WAM-W1	2.8275 ***	0.1031	5.3371 ***	0.5119	4.8564 ***	0.2881	1.8916 ***	0.1098
WAM-W2	1.8556 ***	0.1866	2.7246 ***	0.8186	4.4199 ***	0.4938	0.1595	0.2049
WAM-W3	0.0034 ***	0.0004	0.0028	0.0017	0.0084 ***	0.0011	0.0009 **	0.0004
WAM-ROE	0.1361 ***	0.0165	-0.0635	0.0677	0.4894 ***	0.0521	0.0834 ***	0.0178
WAM-NPL	-0.4086 ***	0.0994	-1.2912 ***	0.4199	-0.0761	0.2905	-0.6591 ***	0.1076
WAM-EQRAT	-0.6287 ***	0.1344	-2.1885 ***	0.7038	-2.9073 ***	0.3939	0.6803 ***	0.1413
WAM-EFFIC	-0.1584 ***	0.0287	-0.1732	0.1259	-0.3015 ***	0.0705	-0.1524 ***	0.0322
BANK-LNAGE	-0.1791 ***	0.0039	-0.1920 ***	0.0200	-0.1415 ***	0.0112	-0.1613 ***	0.0043
BANK-YOUNG	0.1514 ***	0.0128						
BANK-ADOLES	0.0588 ***	0.0078						
BANK-MERGE	-0.0689 ***	0.0125	-0.1155 **	0.0579	-0.2052 ***	0.0337	-0.0414 ***	0.0134
BANK-ACQUIS	0.0665 ***	0.0078	0.1820 ***	0.0343	0.0956 ***	0.0173	0.0473 ***	0.0091
BANK-LNGTA	0.1245 ***	0.0084	0.0779 **	0.0305	0.0770 ***	0.0207	0.1464 ***	0.0096
BANK-SZU10	-0.0015	0.0265	-0.1502 *	0.0834	-0.0545	0.0764	0.0439	0.0299
BANK-SZ1025	-0.0298 **	0.0124	-0.0967 **	0.0426	-0.0046	0.0302	-0.0428 ***	0.0143
BANK-SZ2550	-0.0183 ***	0.0065	-0.0671 ***	0.0229	-0.0106	0.0158	-0.0227 ***	0.0074
BANK-ONEBHC	0.1245 ***	0.0040	0.0203	0.0154	0.0858 ***	0.0098	0.1646 ***	0.0045
BANK-MBHC	0.0793 ***	0.0051	-0.1449 ***	0.0183	-0.0395 ***	0.0123	0.1624 ***	0.0059
BANK-MUL_LAY	0.0070	0.0083	0.0406	0.0437	-0.0838 ***	0.0209	0.0316 ***	0.0091
BANK-OUTST	-0.0567 ***	0.0101	-0.1562 ***	0.0371	-0.0367	0.0251	-0.0467 ***	0.0116
BANK-ROE	-0.0889 ***	0.0095	-0.1237 ***	0.0275	-0.1159 ***	0.0193	-0.0207	0.0126
BANK-EQRAT	-1.4864 ***	0.0645	0.1189	0.1729	0.9662 ***	0.1661	-3.4795 ***	0.0829
BANK-NPL	0.6601 ***	0.0624	0.8037 ***	0.2073	0.8723 ***	0.1521	0.6745 ***	0.0725
BANK-SHARE	-0.2218 ***	0.0218	-0.6740 ***	0.1793	-0.4583 ***	0.0806	-0.2823 ***	0.0237
Num. Obs.	164,047		11,136		27,619		125,292	
Adjusted R^2	0.2523		0.1602		0.1303		0.1501	

* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

Table 9b
Grouped Logit Estimation of C&I Lending
1995-1998 Subperiod

	Small Banks of All Ages		Young Small Banks (1-5 years)		Adolescent Small Banks (6-20 years)		Mature Small Banks (21+ years)	
Variable	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
INTERCEP	-1.3959 ***	0.3728	1.0718	1.7284	-1.7799 **	0.7021	-1.4507 ***	0.3882
WAM-MERGE	0.2001 ***	0.0403	0.1456	0.2118	0.0085	0.0861	0.3770 ***	0.0497
WAM-ACQUIS	0.1971 **	0.0959	0.8665	0.6235	0.5172 **	0.2416	0.1421	0.1076
WAM-HERF	0.2068 ***	0.0547	0.2891	0.4175	0.0928	0.1426	0.2123 ***	0.0592
WAM-SHAREL	-0.0907 ***	0.0277	-0.3512	0.2877	0.2755 ***	0.0903	-0.1429 ***	0.0286
WAM-SHAREC	-0.0518 ***	0.0199	-0.0354	0.1196	-0.1282 ***	0.0458	-0.0224	0.0238
BANK-INMSA	-0.0734 ***	0.0237	-0.0312	0.1600	0.0138	0.0667	-0.0790 ***	0.0252
UNITB								
LIMITB	-0.0326 ***	0.0096	0.0105	0.0640	-0.1353 ***	0.0284	-0.0047	0.0102
NEWLIB	-0.0913	0.0572	-0.6182 *	0.3485	-0.1632	0.1362	-0.0344	0.0638
INTST	-0.1303	0.2413					-0.3109	0.2230
STINCOME	0.4988 ***	0.1590	0.4661	1.0952	0.4946	0.4204	0.4521 ***	0.1715
WAM-GROW	0.0358	0.0278	0.0357	0.1635	-0.0383	0.0594	0.0842 **	0.0329
WAM-PFRAT	-0.1600 **	0.0773	0.0531	0.4647	0.1156	0.1976	-0.2010 **	0.0887
WAM-LNDEP	0.0341 ***	0.0092	0.0070	0.0457	0.0337 *	0.0201	0.0373 ***	0.0114
WAM-MDEP1	0.0742 *	0.0393	0.0005	0.1848	-0.0514	0.0830	0.1938 ***	0.0495
WAM-MDEP2	0.0028	0.0237	-0.0519	0.1082	-0.0233	0.0480	0.0626 **	0.0311
WAM-RDEP1	-0.0927 *	0.0542	-0.7307 *	0.4013	0.0198	0.1391	-0.0022	0.0652
WAM-RDEP2	-0.1006 **	0.0460	-0.5207 **	0.2628	-0.0883	0.1064	-0.0239	0.0568
WAM-RDEP3	-0.0801 **	0.0400	-0.1626	0.2030	-0.0391	0.0864	-0.0111	0.0501
WAM-P1	0.4798 **	0.1877	0.3695	1.2103	-0.7676	0.5108	0.7297 ***	0.2054
WAM-P2	-0.6048 ***	0.1505	-0.5142 **	1.1995	-0.1721	0.4321	-0.5017 ***	0.1594
WAM-P3	-1.4607 ***	0.4378	4.8367	4.2902	-1.7360	1.3121	-1.6996 ***	0.4507
WAM-P4	-6.4207 ***	0.7807	-7.0938	5.3843	-7.7848 ***	1.9225	-5.4039 ***	0.8770
WAM-W1	5.6432 ***	0.6398	5.9737	4.6438	8.3347 ***	1.8319	5.1396 ***	0.6780
WAM-W2	-4.7940 ***	0.7488	-8.6704 **	4.1808	-5.7527 ***	2.1385	-4.1865 ***	0.8272
WAM-W3	0.0028 ***	0.0010	0.0015	0.0071	-0.0061 **	0.0026	0.0036 ***	0.0011
WAM-ROE	0.6455 ***	0.1247	1.4315	0.9754	0.5390 *	0.2885	0.7538 ***	0.1410
WAM-NPL	-0.0163	0.4327	-4.8471	4.1617	1.8573	1.4789	-0.1997	0.4396
WAM-EQRAT	-0.2330	0.3253	-2.9131	3.3719	-2.7489 ***	0.9818	0.4486	0.3395
WAM-EFFIC	-0.0321	0.0609	-0.2194	0.4287	-0.0672	0.1491	-0.0705	0.0690
BANK-LNAGE	-0.1465 ***	0.0099	-0.0919 ***	0.0874	-0.1553 ***	0.0321	-0.1337 ***	0.0104
BANK-YOUNG	0.0611 *	0.0352						
BANK-ADOLES	0.0202	0.0202						
BANK-MERGE	0.0013	0.0244	0.2596 *	0.1480	-0.0248	0.0755	-0.0211	0.0255
BANK-AQUIS	0.0019	0.0206	0.0556	0.1762	0.0701	0.0534	0.0036	0.0226
BANK-LNGTA	-0.0144	0.0216	-0.2088	0.1326	0.0190	0.0545	-0.0152	0.0236
BANK-SZU10	-0.2028 **	0.0812	-0.4181	0.5113	0.0448	0.2928	-0.2432 ***	0.0834
BANK-SZ1025	-0.0751 **	0.0326	-0.2426	0.1833	0.1099	0.0860	-0.1132 ***	0.0354
BANK-SZ2550	-0.0228	0.0168	-0.0849	0.0951	0.0591	0.0415	-0.0527 ***	0.0186
BANK-ONEBHC	0.1408 ***	0.0111	0.0266	0.0593	0.1109 ***	0.0247	0.1847 ***	0.0133
BANK-MBHC	0.1308 ***	0.0145	-0.1746 *	0.0900	0.0805 **	0.0378	0.1653 ***	0.0165
BANK-MUL_LAY	-0.0391 **	0.0162	-0.1049	0.1426	-0.1683 ***	0.0440	-0.0102	0.0173
BANK-OUTST	-0.1246 ***	0.0224	-0.0844	0.1301	-0.1506 ***	0.0524	-0.1306 ***	0.0259
BANK-ROE	0.2787 ***	0.0535	-0.1207	0.3319	0.1376	0.0924	0.4849 ***	0.0820
BANK-EQRAT	-1.6278 ***	0.1420	-0.6657	0.6440	0.6570 **	0.3274	-3.0044 ***	0.1762
BANK-NPL	0.0184	0.1904	-1.7402	1.3419	-0.0642	0.4273	0.4883 **	0.2184
BANK-SHARE	-0.2757 ***	0.0493	-0.1258	0.8668	0.0361	0.1845	-0.3131 ***	0.0512
Num. Obs.	19,497		765		4,020		19,497	
Adjusted R^2	0.1734		0.0676		0.0860		0.1068	

*Significant at the 10% level
**Significant at the 5% level
***Significant at the 1% level

Some missing or unusual coefficients and standard errors appear for some of the state banking regulation variables for the 1995-1998 subperiod because most of the deregulation occurred prior to 1995.

UNITB is excluded from these regressions because there were no unit banking states over this subperiod.

The variable INTST takes the value 1 for all young and adolescent banks yielding exclusions of this variable from these regressions.