Consolidation in U.S. Banking:
Implications for
Efficiency and Risk

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I. Introduction

We don't really know why the U.S. banking industry is consolidating rapidly, as it has been doing for the last decade or so. After a large number of studies on the topic including this one, what seems clear is that consolidation is not producing significant efficiencies—at least not on average. Other dimensions of the consolidation trend—such as its heavy concentration in large banks—are just as poorly understood. Given this ignorance as to the "why" of consolidation, it is extremely risky to predict its future effects. Based on past experience and data, at least, we can conclude the following.

First. Consolidation is having a minimal effect on the efficiency of the banking industry. For some reason, the lion's share of mergers has occurred among relatively large banks, which have the least potential for efficiency gains due to economies of scale. New empirical work presented in this study finds that when small banks do merge, the average result is significant gains in cost efficiency and profitability. This finding seems quite robust and is consistent with predictions of the empirical literature on economies of scale in banking. However, small bank mergers are simply too infrequent—and involve too small a share of industry assets—to have any significant effect on overall industry performance.

Second. The consolidation trend has increased concentration in the banking industry very substantially at the state and national levels. However, at the level of actual bank markets (counties, SMAs and so on) it has not had a large effect—at least not yet. Thus, assuming that the traditional measures of banking market structure are the correct ones, consolidation has not yet had a great effect on competition in banking. To the extent that it has, however, the effect has surely been detrimental. From an antitrust perspective, this trend is reason for concern.

Third. Recent years have witnessed an extremely profitable banking industry; but, there is no reason to believe that consolidation is causing this enviable profits record, or vice versa. In such

an environment, the efficiency and risk effects of consolidation are difficult to ferret out. The next major downturn in the banking industry, whenever that is, will provide the test. On the one hand, consolidation should in principle result in banking firms that are better diversified, both in terms of products lines and geographically. On the other hand, there is no evidence that, ceteris paribus, large banks are less likely to fail than are small banks. Recent events in France and Japan clearly demonstrate that even the largest banks can get into dire trouble.

Fourth. What is most troubling about the consolidation trend, is its implications for the policy of "Too Big to Fail" (TBTF). Whether officially stated policy (as in the U.S.) or not, such a policy exists. Government claims to the contrary are time-inconsistent, and resultantly are discounted by the marketplace. TBTF conveys an unfair, unintended competitive advantage upon large banks, since it defacto insures their liabilities at no cost. In addition, it is a source of moral hazard, beyond the moral hazard produced by deposit insurance systems. The more concentrated a banking industry, the more of its firms that fall into the TBTF category; thus, the more subject it is to such distortions. And, the risk of TBTF government bailouts is commensurately greater. These disadvantages could be offset by significant efficiency advantages to a banking industry composed of large banks. Unfortunately, these other advantages do not appear to exist, except for scale economies resulting from the consolidation of very small banks.

II. Recent Developments: The Consolidation Phenomenon

As shown in Figure 1 and Table 1 the number of new bank charters exceeded exits via merger and failure between 1975 and 1984. In 1984 the number of banks and trust companies in the country peaked at 14,496. Between 1984 and 1994 new charters declined, failures jumped sharply, and the rate of mergers increased almost monotonically. As a result, the number of banks in the United States fell to 10,451 in 1994, or about 28 percent from the peak in 1984. Exit via

failure was primarily due to the hard times the industry experienced from 1987 to 1991. However, the rate of new entry remained extremely low by historical standards after 1991, and the merger rate remained high during the 1990s. Over the five-year period 1990 to 1994, on average 460 banks were merged out of existence in each year.

Table 2 shows that the large decline in the number of firms has not been confined to commercial banks; it has similarly affected the savings and loan industry. Indeed, over the period 1985–94, while the number of banks declined by about 28 percent, the number of thrift institutions declined by more than 40 percent. Part of this thrift contraction is a hangover from the inherited problems of the "thrift crisis." However, thrift institutions, with their large bases of retail deposit customers, have also made attractive acquisition candidates for commercial banks. In this sense, consolidation in banking has extended even beyond the commercial banking industry.

IIa. Merger Activity By Size of Bank

Table 3 shows the rate of merger activity by commercial banks over the period 1980–94, by size class. The left-hand panel in this table shows the number of acquisitions by size class of *acquiring* banks. Not surprisingly, large banks were by far the most active buyers. Out of 6,347 total acquisitions, 3,072 (about 48 percent) were done by banks over $1 billion in assets.[1]

The column labelled "Percent of Banks in Size Class," shows the number of acquirers in size class, divided by the total number of banks that were of that size at the end of 1980. Thus, this column represents the number of acquisitions relative to firms in the class; or, roughly speaking, the "rate of acquisitions" by size-class of bank.[2] For example, banks in the smallest size-class ($0–$10 million) did 27 acquisitions over the sample period. There were 2,811 firms of this size in 1980 resulting in a computed merger rate of (27/2,811) = 1.0 percent. The merger rate increases monotonically and rapidly with size class. For the largest size class, (over $5 billion), the merger

rate was 5,665 percent. In other words, the average bank in this group acquired about 57 banks over the 1980-94 period. Clearly, the largest banks did a hugely disproportionate amount of the buying.

This may seem to fit the conventional "big fish eating small fish" stereotype of acquisitions. However, as shown in the right-hand panel in Table 3, the stereotype is not exactly accurate in this instance. The right panel is the same as the left, except that merger activity is measured in terms of *acquired*—as opposed to acquiring—banks. By number of acquisitions, most of the activity involved small- and middle-sized banks, those with total assets of $500 million or less. Out of 6,347 total mergers over the sample period, 6,038 (or about 95 percent) involved acquired banks in this size range. However, the acquisition rate by size of the acquired is almost monotonically increasing in size. In the smallest size category, the ratio of acquired banks to number of banks in size class is 16 percent. In the largest size class, the ratio of acquired banks to banks in size class is more than 117 percent.

Table 4 gives a different perspective on this phenomenon. This table shows the total dollar value of *acquired* bank assets over the 1980-94 period, by the size class of the acquired. In these computations, we assume that all banks in a class have total assets exactly at the midpoint of their class range. This presents an obvious problem for the largest, open-ended size class which has no midpoint. Therefore, in case A we assume that all acquired banks in this class have total assets of exactly $5 billion—the most conservative assumption possible. In case B, we assume that they have total assets of $10 billion—still conservative, we think. As shown in Table 4, the results are not particularly sensitive to this assumption.[3]

What Table 4 shows is that, in terms of assets redeployed within the banking industry, the merger phenomenon was *heavily concentrated among banks which were relatively large in the first place*. Even under the most conservative assumption possible, about 85 percent of acquired assets

were acquired from banks in the "over $100 million" category; about 54 percent were acquired from banks in the "over $500 million" category.

We believe this fact has important implications for the bank merger phenomenon, and how one tries to understand it. Very briefly, it is among the smaller banks that one would expect, a priori, to find significant scale economies after merger. To be sure, a substantial portion of small banks were acquired during 1980-94. For example, about 51 percent of dollar assets of banks in the "$100 million or less" class were acquired.[4] However, as shown in Table 4, no more than 15 percent of all acquired assets were of banks in the "$100 million and under" class, where efficiency gains are likely (and this estimate is biased on the high side).

We shall return to this issue, since it prompts us to investigate the efficiency gains resulting from mergers of very small banks. Before turning to our own empirical work, we first review some theory. In Section III which follows, we analyze the theoretical arguments why consolidation might, a priori, be expected to affect the performance of the banking industry.

III. The Economic Logic: Why Consolidation Could Affect Performance

In this section we review the economic arguments as to why consolidation might be expected to affect the performance of the banking industry. We consider three main arguments. The first is that there is excess capacity in banking and, resultantly, that consolidation is a useful way of mobilizing resources to other sectors of the economy. The second argument is that consolidation increases concentration in bank markets, and permits banks to earn increased monopoly rents. Although this may not be a socially optimal outcome, it would surely affect the profitability of the industry. The third argument is that there are economies of scale in banking; by increasing the average size of firms in the industry, consolidation may allow banks to operate more efficiently. In

this context, several measures of efficiency have been considered in the literature: profits, operating costs, and risk exposure.

IIIa. Excess Capacity in Banking

It has been widely believed that banking is a declining industry, faced with reduced demand for the intermediation services it produces. In support of this view, economists have relied on data which show banks with a declining share of intermediated savings instruments (for example, deposits), loans, and total savings of the consumer sector. Most often, these data are from the Federal Reserve's Flow-of-Funds Accounts; and indeed, they do show a marked decline in commercial banks' share beginning, roughly, in the early 1980s. However, recent research (Boyd and Gertler 1995) suggests that the banking industry is not actually declining in any meaningful economic sense; rather, the nature of its intermediation activity is just changing.

It is true that banks have lost loan market share to nonbank lenders and have lost deposit market share to money market mutual funds and others. However, these measures are based on balance sheet data and ignore the rapid growth of new bank product lines which do not appear on balance sheets. These include financial guarantees of different kinds, a variety of products based on derivative securities, consulting, funds management, investment banking, and so on. Figure 2 below is an update of one provided by Boyd and Gertler. It shows that noninterest income (from off-balance-sheet sources) has more than doubled from about 0.75 percent of total assets in 1980 to 1.9 percent in 1994. None of this explosive growth in off-balance sheet activity is captured in the traditional market share measures.

Boyd and Gertler noted a second reason why market share computations based on Flow-of-Funds data have been misleading. Economists at the New York Fed (McCauley and Seth 1992) documented that official numbers on banks' commercial lending substantially underestimated the true

totals. Although the Fed now reports commercial loan data which avoid this problem, lending totals were substantially under-reported in the late 1980s and early 1990s.[5]

Boyd and Gertler reconstructed banks' share of total financial intermediation, correcting for the understatement of commercial lending. They also employed several different methods to capitalize noninterest income—in effect turning that income into "balance sheet equivalent" assets. Figure 3 shows an updated version of their market share computations. The unadjusted bank share clearly peaked in about 1975 and declined continuously and substantially after that. The adjusted share computations (labelled "NIC-2" and "Basle Adjusted") also show some evidence of decline after 1975, but that decline is very slight and not statistically significant. Construction of the adjusted share measures is fully explained in Boyd and Gertler, op. cit. and will not be discussed here. It is worth noting, however, that of the two adjusted share measures the larger "NIC-2" measure is preferred.

When these adjustments are made, the conventional view simply does not appear to be right. Banks' share of financial intermediation in the United States has been roughly constant over the last four decades. In sum, banking doesn't need mergers as a means to shift resources out of a declining industry. Thus, there's no reason to view this as a desirable feature of consolidation, or one that would be beneficial to the banking industry.[6]

IIIb. Increasing Concentration in Banking

Banking concentration has risen substantially in the past decade. At the metropolitan area (MSA) level, the average share of total domestic commercial bank deposits held by the three largest banking organizations increased from 66.4 percent to 67.5 percent between 1980 and 1992. At the state level, the average share held by the three largest banking organizations rose from 29.9 percent to 38.6 percent between 1984 and 1994. And, at the national level, the share held by the 100 largest

banking organizations rose from 50.8 percent to 66.1 percent over the same period (Amel 1996, Savage 1993).

There is ample reason to believe that increasing concentration in bank markets, holding other factors constant, is associated with increasing bank profitability. A large number of studies have found that, when concentration rises in bank markets, loan rates tend to rise and deposit rates tend to fall. These findings suggest an increased ability to earn monopoly rents (which may or may not be accompanied by scale efficiencies). Interestingly, a recent study by Berger and Hannan (1995) finds that as concentration increases, banks actually become *less* efficient, in the sense that operating costs rise with no accompanying increase in services provided. One possible explanation for this finding is that bank managers use their rent-earning ability in pursuit of the "quiet life." That is, the ability to earn some rents permits them to operate less efficiently than they would otherwise do, with less managerial effort, more consumption of perquisites, and so on.

We have no idea how much of the recent increase in concentration in bank markets is due to merger activity, and how much is due to other developments. However, it seems that the net effect on bank profitability cannot have been large, at least not yet. That's because the increase in measured concentration at the actual bank market level (counties or MSAs) has not been too great. Thus, to the extent that these traditional definitions of bank markets are correct, we would not expect a large boost to bank profits. From an anti-trust perspective, however, the trends in these data are still cause for concern.[7]

IIIc. Economies of Scale in Banking

There is a large empirical literature on cost economies of scale in banking, which is nicely summarized in Berger, Hunter, and Timme (1993). The consensus of this research is that, in terms of production costs, there are marked economies of scale for firms in this industry, but only up to

a fairly modest size. After that, further increases in scale appear to have very limited effects on production efficiency. There is some disagreement as to the point at which the efficiency curve flattens, and estimates have ranged anywhere from $25 million to $500 million in assets. There is also some disagreement as to what happens beyond that point, with some researchers finding cost-efficiency gains over a very long output range (Shaffer 1993) and others actually finding diseconomies of scale for sufficiently large output levels. Still, the consensus seems to be that after a relatively modest scale is achieved, there are neither great advantages nor disadvantages to getting bigger.[8]

An alternative to the statistical cost approach is to examine the market prices of bank equities (or Tobin's q), on the grounds that significant scale economies should be reflected in them. Unfortunately, meaningful equity prices are only available for a few hundred banks in the United States, generally the largest ones. One study which takes this approach is Boyd and Runkle (1993). Over the size range they considered, they found no evidence of cost efficiencies of scale. However, there was evidence of risk efficiencies—in the sense that portfolio diversification seemed to improve with size of bank. However, Boyd and Runkle also found that as size increased, average profitability systematically fell and leverage increased. The combined net effect of the three factors was that large banks were no less likely to fail than were smaller ones. That finding logically leads us to a third and different way of looking at economies of scale in banking.

Scale and Failure Rates

From a policy perspective, the "bottom-bottom line" in size-performance comparisons is failure rates. After all, it is bank failures which result in costs to the deposit insurer or even, possibly, in negative externalities for the macro economy. Some years ago we (Boyd and Graham 1991), published numbers on U.S. bank failure rates by size, which were different from the official

numbers released at that time. Specifically, we defined as "failed" any bank officially listed as failed, plus any bank which had received an infusion of government funds (in any form). Continental Illinois was a highly visible institution which fell into the second category. Table 5 recomputes and updates those numbers through 1994. Given the fortunate fact that failures of banks in the billion-dollar-plus category are relatively few, we can only meaningfully construct two size categories: below $1 billion in assets, and above $1 billion in assets. Since there is some judgment involved in classifying an institution as failed and in dating that occurrence, we have listed all the large banks so-classified in Appendix A. In reading Table 5 it is important to be aware that the numerator is *cumulative* failures over the period; these are not annual rates.

We have divided the data into three time intervals: 1971–78, 1979–86, and 1987–94. In the first two sub-periods, the large bank failure rate was higher than the small bank failure rate, and significantly so in 1971–78. The last period, 1987–94, included some of the worst years for banking since the Great Depression. These numbers clearly show it. For small banks the cumulative failure rate nearly tripled and for large ones it nearly doubled. In this last subperiod, the large bank failure rate was somewhat lower than that for small banks. Over the entire period, 1971–94, however, the small banks did somewhat better than the large ones, with a cumulative total failure rate of 12 percent versus 17 percent.

These numbers suggest to us that there's no evidence, based on recent U.S. experience, that large banks are less likely to fail than are small ones. Too, they underscore the importance of what one defines as a "bank failure."

Summary

We have reviewed three economic arguments as to why consolidation in banking might be expected, a priori, to favorably affect industry performance. The first argument is that banking is

a declining industry, which would benefit from a mobilization of resources to other economic sectors. We reject this argument on the grounds that the data, when correctly analyzed, do not suggest that banking is declining. A second argument is that consolidation will increase concentration and rent-earning in banking—thus benefiting banks if not society. Although this argument is surely correct, we find that (so far) the average rise in concentration in bank markets has not been enough to greatly affect profits. A third argument is that there are economies of scale which will be realized when banks merge. The existing literature, however, suggests that such cost efficiencies will generally be confined to mergers involving small banks. Finally, there is some evidence that large banks are benefited by better diversified asset holdings, which could represent a different form of scale economy in banking. However, if such an advantage exists, it simply does not show up in the data on failure rates of large versus small banks.

IV. Studies Evaluating the Efficiencies From Bank Mergers

In this section we review previous studies of the efficiencies resulting from bank mergers. First, we look at the "event test" literature; then we turn to operating performance studies.

IVa. Event Test Studies

A large number of studies (nicely reviewed in Rhoades 1994) have employed the event test methodology to examine the gains from bank mergers. This methodology has been widely employed in the finance literature, is well understood, and will not be reviewed here. In essence the idea is that equity markets are speedy and efficient aggregators of information. Immediately upon the announcement of a bank merger, therefore, stock prices should reflect the market's best prediction of the effect of that merger. Positive (negative) abnormal returns signal good (bad) predictions.

The results of such tests are best described as "mixed," but in general they do not suggest the existence of significant efficiency gains in bank mergers. Although the shares of the target firm

frequently exhibit positive abnormal returns, shares of the acquirer frequently exhibit negative ones. Thus the total, combined wealth effect to both parties is generally small and of ambiguous sign. In any "event," there are several reasons to view the findings of this literature with caution. For one thing, the results seem to depend substantially on technical details such as the length of the "event window." For another, meaningful price data only exist for bank holding companies whose shares are actively, publicly traded. There are just two or three hundred such firms in the United States; thus sample sizes are necessarily small, and restricted to mergers involving only the largest banks.

IVb. Operating Performance Studies

Numerous studies have examined the effects of bank mergers on bank operating efficiency and profitability (also reviewed in Rhoades 1994). The results generally suggest that mergers do not improve cost efficiency or profitability. Rhoades identifies 19 such studies published between 1980 and 1993. The typical methodology used in these studies is to compare the performance of merging banks before and after merger to a control group of nonmerging banks. The studies encompass a large range of performance variables. The most frequently used are the noninterest expense-to-asset ratio as a measure of cost efficiency, and the net income-to-asset (ROA) and/or net income-to-equity (ROE) ratios as measures of profitability. Most of the studies evaluated efficiency differences by comparing selected expense ratios across banks, but a few studies estimated translog production functions to measure X-efficiency and scale efficiency. The studies varied in the length of time over which the comparisons were made, ranging from five years prior to the merger to eight years after. Several studies analyzed performance differences of large bank mergers, but only one study examined small bank mergers, and that one involved failing banks.

The results of these studies generally suggest that the efficiency and profitability of merger banks relative to nonmerger banks do not improve after the merger. Only two studies with a sample

size greater than one (Linder and Crane 1993, Spong and Shoenhair 1992) reported a relative improvement with respect to efficiency. However, none of the studies that used total expenses as a measure of efficiency found a relative improvement after merger. Only four studies (Spindt and Tarhan 1991, Cornett and Tehranian 1992, Rose 1992, Perestiani 1993b) reported a relative improvement in the ROA or ROE measures of profitability after merger. However, no study showed a relative improvement in both the ROE and ROA, or in both the efficiency measure and a profitability measure.

V. Economic Effects of Mergers of Small Banks

Empirical studies of scale economies in banking have generally concluded that significant inefficiencies exist at the low end of the size spectrum. A logical way to test this result is to examine changes in efficiency that have occurred as a result of small-bank mergers. Empirical studies of efficiencies in bank mergers have either examined large-bank mergers or have not focused on size at all. We are not aware of any studies that look specifically at small bank mergers with this objective in mind.[9]

We examined the effects of small-bank mergers that occurred in 1989, 1990, and 1991, restricting our sample to mergers of independent banks where the surviving bank had total deposits of $400 million or less. Our definition of an independent bank merger excluded: 1) a consolidation of banks belonging to the same bank holding company or chain; 2) a merger where the surviving bank belonged to a multibank holding company and the surviving bank held only a small proportion of the holding company's deposits; and 3) a merger where either partner was a failed bank. We deleted a surviving bank from the sample in the year that it failed, became a target bank in a merger, or was acquired by a large multibank holding company. A surviving bank that was involved as a survivor in mergers in more than one year was counted only once in the sample—in the year of its

most recent merger. This set of restrictions yielded a sample of 157 mergers (53 in 1989, 50 in 1990, and 54 in 1991). Survivor banks are listed in Appendix B and Table 6 shows the size distribution of the sample.

We tested the efficiency results by comparing performance variables in the year preceding the merger with each of the three years following the merger, excluding the merger year itself. For the year before the merger we simply consolidated the target and survivor banks. We employed three performance measures: the ratio of net income to total assets (ROA), the ratio of noninterest expenses to total assets (NIE/A), and the ratio of total expense to assets (NIEE/A). All three measures are net of goodwill amortization to reflect the argument that the premium paid in a bank merger is independent of operating efficiency.

Va. Empirical Findings

Table 7 shows performance measures for our sample of small banks, before and after merger. Medians are reported since the means are heavily influenced by one or a few outliers. This table turns the sample bank medians into "performance relatives," dividing each of them by the industry average for all banks with assets of less than $1 billion in that year. Of course, this procedure accounts for time-trends in the industry data. All the entries in the ROA panel are greater than 1.0 and all those in the expense ratio panels are less than 1.0—reflecting a strong performance of the median sample bank relative to the industry. Before-and-after merger comparisons are unambiguously favorable with the NIE/A measure, which is always lower after merger than it is before. The comparisons are also favorable with the NIEE/A measure, showing improvement (or no change) in eight out of nine cases. However, before-and-after comparisons are ambiguous with the ROA measure. For some reason, 1989 mergers did quite well, 1991 mergers did badly, and 1990 mergers were somewhere in the middle.

Multivariate Regressions

Table 8 shows the results of multivariate tests in which the three performance variables, ROA, NIE/A and NIEE/A are regressed on different sets of explanatory variables. All of these tests include year dummy variables to represent time effects, and individual firm dummy variables to represent firm effects. For brevity, the firm dummies are not included in Table 8, since there are 156 of them. Sample means, medians and correlations, as well as all variable definitions, are shown in Table 8D.

Table 8A shows regressions in which the three performance measures are regressed on a dummy variable for whether the bank is merged or not at the time of the observation (MERGED). Also included is a measure of bank size (LSIZE): the natural log of consolidated assets in the year of merger. Finally, there is an interaction term between size and the merger status dummy variable (LSIZEDUM). The results in panel A are similar with all three dependant variables. Being merged "helps" in the sense of increasing ROA, and decreasing the expense measures, NIE/A and NIEE/A. The coefficients on these dummy variables are significantly different from zero at (at least) the 90 percent confidence level. However, in each case the interaction term enters with the opposite sign of the merged dummy, and is also highly significant.

These regressions clearly suggest that there can be efficiency gains to merging, but these depend on the size of banks involved. In essence, the smaller the banks the greater the merger benefit. However, these results also have the implication that above a certain size of merging firms, the ceteris paribus effect of merging is to *decrease* profitability and increase expenses. This turning point falls within the range of our sample data; for example when ROA is the dependent variable it occurs when total assets of the merging firms are about $238 million. We do not take this result too seriously, however, since it is not borne out by the regressions that follow.

The regressions presented in Table 8B are quadratic in both bank size, and in the relation between size and merger status. Specifically, these regressions include separate terms for bank size (SIZE), size squared (SIZESQ), the merger status dummy (MERGED), a linear merger-size interaction term (SIZEDUM), and a merger-size squared interaction effect (SIZESQDUM). The idea is to try to separate the *direct effect* of size on bank performance from the effects of merging on bank performance. As we have just seen, the effects of merging may also depend on the size of the merging firms. And we know from previous research that there is a strong direct relation between size and performance, which is likely to be nonlinear (Boyd and Gertler, 1993).

In two of three cases the results in Table 8B are consistent with the expectation of a nonlinear direct relation between size and performance. When NIE/A and NIEE/A are the dependent variables, SIZE and SIZESQ enter with opposite signs and are highly significant. This underscores the importance of controlling for these direct size effects. In all three regressions, the merger status dummy variable (MERGED) is highly significant and, as in Table 8A, indicates efficiency gains from mergers. However, the interrelationship between merger benefit and size of bank has now become less obvious. In fact, when NIE/A and NIEE/A are the dependent variables, there is no evidence of a significant interaction effect. When ROA is dependent, the linear interaction term SIZEDUM is negative and significant, as it was in Table 8A.

The results in Table 8B must be interpreted with considerable caution, given the large number of correlated explanatory variables included. However, these results are strongly suggestive of two conclusions. First, whether or not the sample banks are merged, there are strong direct effects of size on performance. This is not surprising given the findings of earlier studies. Second, controlling for these direct effects *does not* eliminate the beneficial effect of mergers on costs and profitability. This is an important robustness check on the merger benefit suggested by the regressions in Table 8A.

Table 8C contains a third and final set or regressions, the results of which are generally consistent with the others. In Table 8C the merger status dummy variable is partitioned into two, distinct classes. The variable MERGEA (B) takes on the value one iff a bank is merged and was above (below) than the sample median asset size at the time of merger. In all three regressions, MERGEB is of the expected sign (indicating merger benefits) and significant at the 95 percent confidence level or higher. But only in the NIEE/A regression is MERGEA significant at the 90 percent confidence level. In sum, the benefits of merging are again apparent, but they are concentrated in the smaller firms in the sample—those with total assets of less than the median, which is about $94 million. These tests do not suggest any "merger detriment" for larger sample banks.

Magnitude of the Merger Effect

The estimated benefits of mergers are highly significant in a statistical sense. As shown in Table 9 they are also quite large in economic terms. Based on the coefficients in regressions for banks below the median sample size, merging results in about an 11 percent average reduction in the noninterest expense ratio (NIE/A), and in the total expense ratio (NIEE/A). In terms of ROA, the estimated merger benefit is almost 60 percent. Table 9 also presents estimates based on the Table 8A regressions, where the merger benefit depends upon the size of the banks involved. These estimates are quite consistent with the Table 8C estimates, indicating a much larger effect on profits than on expenses. We have no idea what accounts for the differential effect, but it is reassuring that both regression specifications produce similar results.

VI. Conclusion

Except for the work with small banks we have just presented, we see little evidence that consolidation of the U.S. banking industry has been particularly helpful over any performance

dimension. In our assessment, there are several possible explanations for this negative finding, which are not mutually exclusive.

First, we don't believe that it is socially desirable to marshall resources out of banking and into other sectors of the economy. The data do not indicate that the banking industry is declining or losing market share over the long haul. If anything, the banking industry appears to have been a growth sector, as has been the financial intermediary sector.

A second possible explanation for the weak performance record of consolidation may lie in the incentive structure which has caused it. As we have argued elsewhere (Boyd and Graham 1991) it is vexing to explain consolidation in banking as a response to market forces. But it may be that managerial hubris, as opposed to ownership interests, is the driving force (Gorten and Rosen 1995). With only a few exceptions, bank mergers have been friendly ones, and these are almost always financially rewarding to senior managements on both sides. In such combinations, branches and staff may get cut substantially (Savage 1991), but there is little trimming of dead wood at the top.

A third possible explanation, the one emphasized in this study, is that the consolidation trend has been concentrated in the acquisition of medium-sized or large banks. These are the ones which present the *least* potential for gains due to scale efficiencies. The new empirical work we have presented is suggestive that when small banks have combined, the average result has been considerable improvement in performance. Undoubtedly, more empirical work needs to be done before that conclusion can be accepted as final. But it is reassuring that our findings are consistent with the empirical literature on economies of scale, which essentially predicted our results.

Looking to the Future

The United States will enter the next banking downturn, whenever that occurs, with a much more concentrated industry than it had the last time. Boyd and Gertler (1993) investigated the last

downturn and what they found was not reassuring—especially not in the context of a now even more concentrated banking industry. Their study concluded that banks with assets in excess of $1 billion contributed a wildly disproportionate amount of total losses, even after controlling for systematic size differences in asset mix and geographic location. They calculated that over the period 1983-91, if large banks (over $1 billion) had done as well as medium-size banks ($250 million-$1 billion), loan losses of the industry would have been reduced by $45 billion (or about 20 percent of total industry capital). They attributed this poor performance record of large banks to the TBTF policy and to bad luck. "Of course, it is the case that large banks were unlucky, since they were heavily invested in assets which experienced negative shocks during the 1980s. However, a similar statement could be made about the savings and loans." (op. cit., p. 20).

An interesting and important question is whether recent policy changes—especially the Basle Accord of 1988 and the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA)—will help to reduce the risk exposure of large banks. FDICIA explicitly recognizes the distortions caused by the TBTF policy, and attempts to attenuate them. However, the TBTF policy still exists and market participants are well aware of that. Therefore, it is hard to predict the net effect of these policy changes. We simply have no experience under the new regime, and in a difficult macroeconomic environment.

Footnotes

[1]Merger data have been constructed by Rhoades (see Rhodes 1996). They exclude mergers where the acquiring and acquired banks were commonly owned prior to merger. They also exclude mergers where the target was a failing or likely-to-fail bank.

[2]This computation is not exactly the rate of acquisitions by size class, since the numerator size is at the time of acquisition (anytime from 1980 to 1994) and the denominator is fixed in 1980.

[3]This is admittedly a "back of the envelope" computation. The more precise alternative would be to tally up all mergers over the 1980–94 period, record the size of each target bank, and then sum the acquired assets within each size class. For a variety of reasons this is a difficult and labor-intensive task. It seemed not worth the effort given the striking nature of the computations presented, even under the most conservative of assumptions.

[4]Calculated as the dollar value of assets of acquired banks (from Table 4) as a percent of the dollar value in 1980.

[5]This ex post correction of the data is of little consolation to the many economists who did empirical studies of the "Credit Crunch" during that period. They were attempting to explain an apparent contraction in bank lending which was largely ephemeral.

[6]Boyd and Gertler (1995) also looked at banks' share of value added to GDP, and banks' share of factor inputs (labor and capital) relative to factor inputs of the national economy. According to these measures, commercial banking has actually been a "growth industry," substantially expanding its share of value added, employment, and net investment in capital and equipment. Although we have not reproduced these computations here, the same is true with our updated data.

[7]From an antitrust perspective (not the perspective of this study) what is alarming in the recent data is the rising concentration levels in rural markets, and in small urban markets. For example, between 1984 and 1994 the average Herfindahl-Hirschman Index (HHI) for all rural

markets increased from 3,584 to 3,724, or 140 points. Over the same period, the average HHI for small urban markets, (those with populations less than 100,000) increased from 1,715 to 1,810, or 95 points (Amel 1996). 1,800 is the threshold above which the Justice Department defines bank markets as "highly concentrated." Note that these are averages, so that in something like half of all markets the actual HHI is higher. The implication is that in many small markets, be they rural or urban, there are competitive problems which are getting worse.

[8]Although this large literature is interesting and informative, we believe it is best viewed as a form of "statistical cost accounting," not really "economies of scale measurement." We say that because, the "output level" or "product" of financial intermediary firms is extremely difficult to define, let alone measure. The output measures typically employed in these statistical cost studies bear almost no relationship to the output measures suggested by the modern theory of financial firms (for example, Diamond 1984 or Boyd and Prescott 1986). Interestingly, the same conceptual issues are present in national income accounting for the financial intermediary sector. One study which rigorously investigates some of these issues is Hornstein and Prescott (1991).

[9]As indicated above, Rhoades identifies one study which examines the mergers of small banks (O'Keefe 1992). It examined mergers involving failed banks and thus is quite different from ours.

Appendix A

Large Bank Failures[1]

1971–94

Year	Name of Bank	Year	Name of Bank
1972	Bank of the Commonwealth, Detroit	1990	Seamen's Bank for Savings, NY
1973	United States NB, San Diego		NB of Washington, DC
1974	Franklin NB, NY	1991	Bank of New England, Boston
1980	First Pennsylvania Bank, Philadelphia		Connecticut B&T, Hartford
1981	Greenwich SB, NY		Maine NB, Portland
	Union Dime SB, NY		Maine SB, Portland
1982	Western New York SB, Buffalo		First NB Toms River, NJ
	New York Bank for Savings, NY		Goldome, Buffalo
	Western Savings Fund Society of Philadelphia		First Mutual Bank for Savings, Boston
	Dry Dock SB, NY		Citytrust, Bridgeport, CT
1983	First NB of Midland, TX		Mechanics & Farmers SB, Bridgeport, CT
	Continental-Illinois NB&T, Chicago		Southeast Bank, Miami
1984	Bowery SB, NY		Connecticut SB, New Haven, CT
1985	First NB&T of Oklahoma City		Crossland SB, Brooklyn, NY
1986	Syracuse SB	1992	Dollar Dry Dock Bank, White Plains, NY
1987	First City Bank, Texas (2 banks)		American SB, White Plains, NY
1988	First Republic Bank, Texas (4 banks)		First Constitution Bank, New Haven CT
	Mbank, Texas (2 banks)		Howard SB, Newark, NJ
1989	Texas American Bank		First City Bank, TX (2 banks)
	First American B&T, North Palm Beach, FL		Merchants Bank, Kansas City, MO
			Heritage Bank for Savings, Holyoke, MA
			Meritor SB, Philadelphia

Source: FDIC *Statistics on Banking.* Historical 1934–1994, vol. I.

[1]Includes all commercial and savings banks with total assets or total deposits greater than $1 billion that were insured by the FDIC or BIF.

Appendix B

Names of Merging Banks and Year of Merger

Merger Date	Survivor Name	Merger Date	Survivor Name	Merger Date	Survivor Name
1989	Mineral King NB	1990	Reelfoot BK	1991	Frontier BK
	Bank North		Cleo St BK		Peoples BK of Cmrc
	Bank of San Diego		California St BK		North Cty BK
	Bank One OK City		First NB&TC		Valliwide BK
	Fairmont Bancorporation		Citizens St BK		United NE BK North Platte
	Summit BK of Muncie		Landmark BK		Liberty NB of Lexington
	Midamerica BK So		First NB of Central California		Farmers ST BK of Adams
	American B&TC		First ST BK		Piper Bshrs
	First Fidelity BK		Civicbank of CMRC		Community BK of TX
	Minnstar BK NA		First NB North Dakota		Bellingham NB
	Belmont NB		First Citizens NB		Horicon ST BK
	National BK of CMRC of MS		Farmers ST BK of Blue Mound		North BK
	First United BK		Nebraska ST B&TC		Caminoreal BK NA
	First Philson BK NA		Dubuque B&TC		Greenbrier Valley NB
	Capital BK		National Exchange B&T		First BK S
	North Shore BK of Commerce		Premier BK South NA		Liberty B&T
	Eldorado BK		State BK of Lincoln		Merchants NB of Winona
	First Central BK		F&M BK NE		State B&TC
	Farmers BK of Cook		Norwest Corp		Princeton BK
	Western BK		Farmers ST BK of Trimont		Peoples BK
	Sterling ST BK Austin MN		Twentieth Street BK		Lincoln Svg BK
	Peoples NB		Barnett BKS		Kansas St BK
	First BK KS		First NB		Central BK
	Pioneer B&TC		Armstrong BK		Hartland BK NA
	Orange BK		First NB		Citizens Bkg Co
	Morton Cmnty BK		West AL B&TC		Huntington Bshrs
	American NB of De Kalb Cty		Western NB		Triumph ST BK
	North Fort Worth BK		First Newton BK		Klossner Bancorporation
	First NB		Farmers NB of Danville		Bank Midwest NA
	Salin BK		Community SVG BK		First KS BK
	First NB		Platte Valley NB-Morrill		Green Mtn BK
	First NB of Hayes Ctr		Omnibank		Warren-Boynton ST BK
	One Valley BK East NA		Farmers BK		First Western BK Sturgis
	Rogers Cty BK		Southern California BK		Murray County ST BK
	Bay Hermann Berger BK		Louisiana NAT Security BK		UnionBank
	First NB of Jermyn		Bank of the West		Huntington ST BK
	Shelby ST BK		Farmers ST BK		Community BK
	United BK IA		Sun Security BK of Amer		First United BK
	Midway NB of St Paul		UMB Security ST BK		First NB Decatur
	Citizens ST BK of Clara City		First ST BK Taos		First NB in Cimarron
	Pinnacle BK		Heritage BK NA		Farmers NB of Geneseo
	Huntington BSHRS		First BK		Commercebank
	Ohio BK		Heartland BK		Central ST BK
	Sunflower BK NA		Windom ST BK		First Cmnty BK
	Stroud NB		Jewell Cty BK		Citizens & Northern BK
	Norwest BK TX Austin		Saline ST BK		Helena NB
	Siuslaw Valley BK		Triangle BK		Wood Cty NB
	First St BK of Ransom		Unibank		BK of New Haven
	Twinco		Tri Cty St BK of El Dorado Spr		First NB of Commerce
	Exchange NB		Commerce Bshrs		Peoples NB of Kingfisher
	Home B&TC of Eureka				United NB-North
	First BK				Emprise BK NA
	UMB Oklahoma BK				First Mid-IL B&T NA
					Security NB of Superior

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Table 1

Changes in the Number of U.S. Insured
Commercial Banks and Trust Companies*

Year	New Charters and Conversions**	Unassisted Mergers	Failures, Assisted Mergers, and Other Exit	Total Banks
1994	67	549	27	10,451
1993	71	481	96	10,960
1992	83	428	116	11,466
1991	141	447	114	11,927
1990	189	393	164	12,347
1989	201	411	212	12,715
1988	232	598	220	13,137
1987	256	543	200	13,723
1986	288	341	154	14,210
1985	376	336	119	14,417
1984	440	332	81	14,496
1983	383	314	51	14,469
1982	325	256	32	14,451
1981	198	210	8	14,414
1980	206	126	10	14,434
1979	207	224	10	14,364
1978	151	165	6	14,391
1977	160	152	7	14,411
1976	167	125	16	14,410
1975	251	84	13	14,384

*Source: FDIC *Statistics on Banking: Historical 1934-94* Vol. I.

**Conversions are primarily thrift institutions converting to a commercial banking charter.

Table 2

Change in the Number of

Banks and Thrift Institutions, 1985–94*

Year	Commercial Banks	% Change	Thrifts**	% Change
1994	10,451	−4.64	2,152	−4.86
1993	10,960	−4.41	2,262	−5.36
1992	11,466	−3.86	2,390	−6.68
1991	11,927	−3.40	2,561	−9.02
1990	12,347	−2.89	2,815	−8.81
1989	12,715	−3.21	3,087	−10.21
1988	13,137	−4.27	3,438	−5.08
1987	13,723	−3.43	3,622	−1.50
1986	14,210	−1.44	3,677	1.41
1985	14,417		3,626	

Cumulative Change 1985–1994: Banks: −27.5%
Thrifts: −40.6%

*Source: FDIC *Statistics on Banking: Historical 1934-94* Vol. I

**Thrifts include savings and loan associations, mutual savings banks, building and loan societies, and so on; credit unions are not included.

Table 3

Bank Merger Activity

by Size Class of Bank, 1980–1994*

Size Class of ACQUIRERS (Assets)**	Number of Acquisitions	Percent of Banks in Size Class	Size Class of ACQUIRED (Assets)**	Number of Acquisitions	Percent of Banks in Size Class
$0–10M:	27	1.0%	$0–10M:	450	16.0%
$10–25M:	240	5.1	$10–25M:	1,450	31.1
$25–50M:	541	15.2	$25–50M:	1,519	42.8
$50–100M:	687	34.8	$50–100M:	1,312	66.5
$100–500M:	1,273	93.9	$100–500M:	1,307	96.4
$500M–1B:	507	314.9	$500M–1B:	141	87.6
$1B–5B:	1,429	893.1	$1B–5B:	134	83.7
$ > 5B:	1,643	5665.5	$ > 5B:	34	117.2
Total:	**6,347**		**Total:**	**6,347**	

*Sources: Rhoades, 1996. FDIC *Statistics on Banking,* 1980.

**M = $million, B = $billion.

Table 4

Dollar Value of Acquired Bank Asset by Size Class
of Acquired Bank, 1980–94

Largest Size Class Assumption*	Size Class	Midpoint ($ Million)	Assumed Midpoint*	Number of Acquisitions	Dollar Value of Assets in Size Class ($ Billion)
	$0–10M	5		450	2.0
	$10M–25M	17.5		1,450	25.0
	$25M–50M	37.5		1,519	57.0
	$50M–100M	75.0		1,312	98.0
	$100M–500M	300.0		1,307	392.0
	$500M–$1B	750.0		141	106.0
	$1B–$5B	3,000.0		134	402.0
A:	> $5B	n.a.	5,000	34	170.0
B:	> $5B	n.a.	10,000	34	340.0

Total Acquired Assets (Assumption A):	1,252.0
Total Acquired Assets (Assumption B):	1,422.0
Percent of Acquired Assets > $100M (Assumption A):	85.0%
Percent of Acquired Assets > $100M (Assumption B):	87.0%

*Under assumption A, banks in the largest class are assumed to have total assets of $5 billion. Under assumption B, they are assumed to have $10 billion.

Table 5

Failure Rate Among "Small" and "Large" Banks

As a Percentage of All U.S. Banks of Each Size 1971–94

| | Asset Size of Banks | |
Time Period	"Small" (< $1Bil.)	"Large" (> $1Bil.)
1971–78	.41%	2.38%
1979–86	3.15	3.79
1987–94	9.30	7.91
1971–94	12.00	17.00

Note: Banks include commercial banks and savings banks insured by the FDIC and, since 1990, by the BIF. For each size class, percentages are based on the cumulative number of failures and the average annual number of banks over the time period specified. The number of large savings banks since 1991 is estimated. The number of failures refers to banks and not to banking firms. For a list of large banks that failed during 1971–94, see Appendix A.

Table 6
Merging Banks by Combined Deposit Size
for Year of Merger

Deposit Size ($ Million)	Year of Merger			
	1989	1990	1991	Total
0–25	3	4	4	11
25–50	15	5	5	25
50–100	17	20	14	51
100–200	13	9	16	38
200–300	4	8	10	22
300–400	1	4	5	10
Total	**53**	**50**	**54**	**157**

Table 7

Performance of Small Merging Banks Relative to
Performance of All Small Banks for
Mergers Consummated in 1989–91

Year of Merger	Ratio of Merging Banks (Median) to All Banks (Aggregate)			
	Year Preceding Merger	Years Following Merger		
		First	Second	Third
Return on Assets (ROA)Merger				
1989	1.32	1.47	1.38	1.14
1990	1.15	1.30	1.13	1.03
1991	1.24	1.09	1.12	1.03
Noninterest Expense/Total Assets (NIE/A)				
1989	.92	.89	.84	.83
1990	.94	.92	.92	.88
1991	.95	.92	.84	.91
(Interest Expense + Noninterest Expense)/Total Assets (NIEE/A)				
1989	.98	.97	.95	.98
1990	.97	.86	.99	.97
1991	.99	.98	.93	.96

Note: Mergering banks have combined total deposits of $400 million or less.
"All banks" are those with total assets less than $1 billion.

Table 8A

Regression Equations: Linear Interaction Effects

1. Dependent Variable ROA

Observations	615	
R-squared	.594	
Durbin-Watson Statistic	2.22	

Variable	Coeff	T-Stat
1. MERGED	.0442	5.31
2. Y88	.0012	.47
3. Y89	.0008	.33
4. Y90	−.0014	.89
5. Y91	−.0007	.54
6. Y92	.0001	.07
7. Y93	−.0007	.63
8. LSIZE	.0005	1.40
9. LSIZEDUM	−.0036	5.10

2. Dependent Variable NIE/A

Observations	615	
R-squared	.813	
Durbin-Watson Statistic	1.91	

Variable	Coeff	T-Stat
1. MERGED	−.0320	4.29
2. Y88	−.0034	1.47
3. Y89	−.0034	1.65
4. Y90	−.0020	1.46
5. Y91	−.0015	1.28
6. Y92	−.0001	.14
7. Y93	.0002	.17
8. LSIZE	.0023	7.15
9. LSIZEDUM ·	.0026	4.22

3. Dependent Variable NIEE/A

Observations	614	
R-squared	.787	
Durbin-Watson Statistic	2.13	

Variable	Coeff	T-Stat
1. MERGED	−.0380	3.63
2. Y88	.0083	2.57
3. Y89	.0193	6.62
4. Y90	.0201	10.31
5. Y91	.0128	7.67
6. Y92	.0067	4.73
7. Y93	.0006	.44
8. LSIZE	.0057	11.46
9. LSIZEDUM	.0028	3.18

Table 8B

Regression Equations: Quadratic Efffects

1. Dependent Variable ROA

Observations	615
R-squared	.596
Durbin-Watson Statistic	2.21

Variable		Coeff	T-Stat
1.	MERGED	1.002e–002	4.97
2.	Y88	3.252e–003	1.34
3.	Y89	2.415e–003	1.10
4.	Y90	−3.492e–004	.24
5.	Y91	−1.081e–005	.01
6.	Y92	6.371e–004	.58
7.	Y93	−3.060e–004	.27
8.	SIZE	2.534e–005	.24
9.	SIZEDUM	−6.081e–005	3.05
10.	SIZESQ	−1.888e–007	.29
11.	SIZESQDUM	8.165e–008	1.62

2. Dependent Variable NIE/A

Observations	615
R-squared	.815
Durbin-Watson Statistic	1.88

Variable		Coeff	T-Stat
1.	MERGED	−3.470e–003	1.93
2.	Y88	−1.964e–003	.91
3.	Y89	−2.023e–003	1.03
4.	Y90	−1.006e–003	.77
5.	Y91	−6.922e–004	.60
6.	Y92	6.277e–004	.64
7.	Y93	8.213e–004	.82
8.	SIZE	6.917e–004	7.44
9.	SIZEDUM	1.517e–005	.85
10.	SIZESQ	−3.717e–006	6.40
11.	SIZESQDUM	1.641e–008	.37

3. Dependent Variable NIEE/A

Observations	614
R-squared	.783
Durbin-Watson Statistic	2.04

Variable		Coeff	T-Stat
1.	MERGED	−5.524e–003	2.13
2.	Y88	1.328e–002	4.28
3.	Y89	2.383e–002	8.46
4.	Y90	2.331e–002	12.35
5.	Y91	1.536e–002	9.39
6.	Y92	8.978e–003	6.43
7.	Y93	2.458e–003	1.72
8.	SIZE	1.511e–003	10.80
9.	SIZEDUM	2.716e–006	.11
10.	SIZESQ	−8.215e–006	9.60
11.	SIZESQDUM	5.287e–008	.83

Table 8C

Regression Equations:
Above and Below Median Size

1. Dependent Variable ROA

Observations	615
R-squared	.587
Durbin-Watson Statistic	2.23

Variable	Coeff	T-Stat
1. Y88	.001102	.43
2. Y89	.001224	.53
3. Y90	−.001399	.91
4. Y91	−.000734	.55
5. Y92	.000055	.05
6. Y93	−.000733	.64
7. MERGEA	.000820	.53
8. MERGEB	.005692	3.41
9. LSIZE	.000564	1.54

2. Dependent Variable NIE/A

Observations	615
R-squared	.809
Durbin-Watson Statistic	1.89

Variable	Coeff	T-Stat
1. Y88	−.003399	1.50
2. Y89	−.003856	1.86
3. Y90	−.002112	1.53
4. Y91	−.001550	1.29
5. Y92	−.000144	.14
6. Y93	.000178	.17
7. MERGEA	−.000104	.08
8. MERGEB	−.003342	2.24
9. LSIZE	.002308	7.03

3. Dependent Variable NIEE/A

Observations	614
R-squared	.786
Durbin-Watson Statistic	2.12

Variable	Coeff	T-Stat
1. Y88	.008505	2.68
2. Y89	.018986	6.55
3. Y90	.020131	10.38
4. Y91	.012823	7.67
5. Y92	.006758	4.74
6. Y93	.000645	.45
7. MERGEA	−.004116	2.13
8. MERGEB	−.007716	3.68
9. LSIZE	.005641	11.40

Table 8D

1. Definition of Explanatory Variables:

LSIZE   = natural logarithm of consolidated total assets, in merger year.

MERGED = dummy variable, merged or not merged in current year.

SIZE   = total consolidated assets, in merger year, in $ millions.

SIZESQ = SIZE^2.

MERGEA = dummy variable for merged, and above median asset size at merger date.

MERGEB = dummy variable for merged, and below median asset size at merger date.

Yi   = dummy variable for year i.

Interaction variables:

LSIZEDUM   = LSIZE*MERGED
SIZEDUM   = SIZE*MERGED
SIZESQDUM = SIZESQ*MERGED

2. Sample Means and Medians

Variable	Mean	Median
ROA	.0095	.0105
NIE/A	.0324	.0301
NIEE/A	.0718	.0711
SIZE ($Mil.)	134.8	94.4

3. Simple Correlations

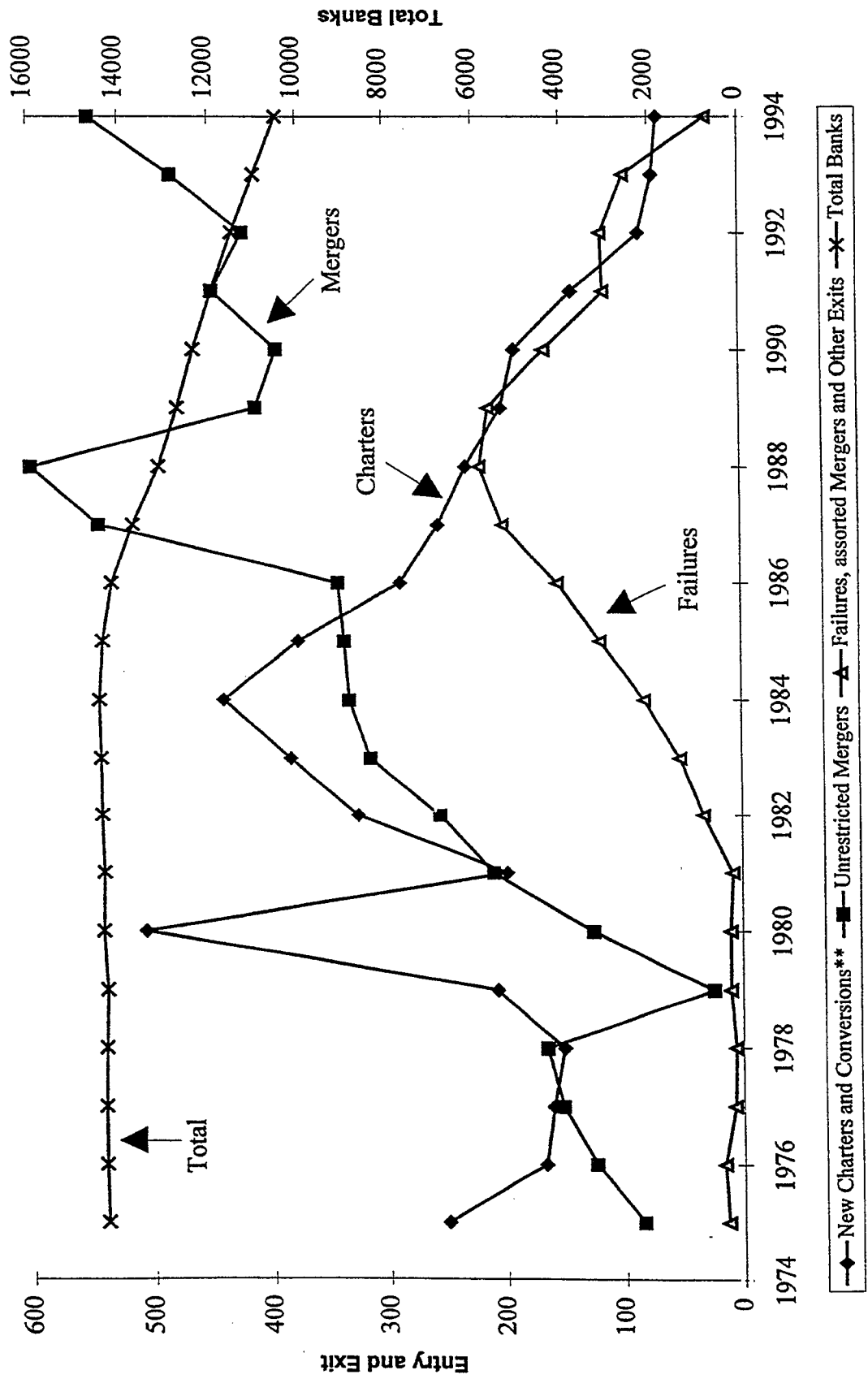|	ROA	NIE/A	NIEE/A	SIZE
ROA	1.00	−.56	−.56	−.16
NIE/A		1.00	.58	.31
NIEE/A			1.00	.10

Table 9

Estimated Merger Benefits:
Percentage Increase in Profitability, or
Decrease in Expense, Due to Merging*

Percentage Change in	From Regressions 8C:**	From Regressions 8A: Combined Asset Size ($ mil.)		
		25.0	50.0	93.8
ROA:	+58.7	+82.5	+57.0	+34.2
NIE/A:	−10.9	−17.0	−11.1	−5.7
NIEE/A:	−10.8	−13.5	−10.7	−8.3

*Estimates based on the Table 8B regressions were not obtained due to the large number of insignificant explanatory variables in those tests.

**Effect for banks below the median sample size of $93.8 million (combined assets, at merger).

Figure 1

U.S. Insured commercial Banks and Trust Companies:
Entry and Exit, 1975-1994.

New Charters and Conversions** — Unrestricted Mergers — Failures, assorted Mergers and Other Exits — Total Banks

* Source: F.D.I.C Statistics on Banking, 1995.

** "Conversions" are primarily thrift institutions converting to a commercial bank charter.

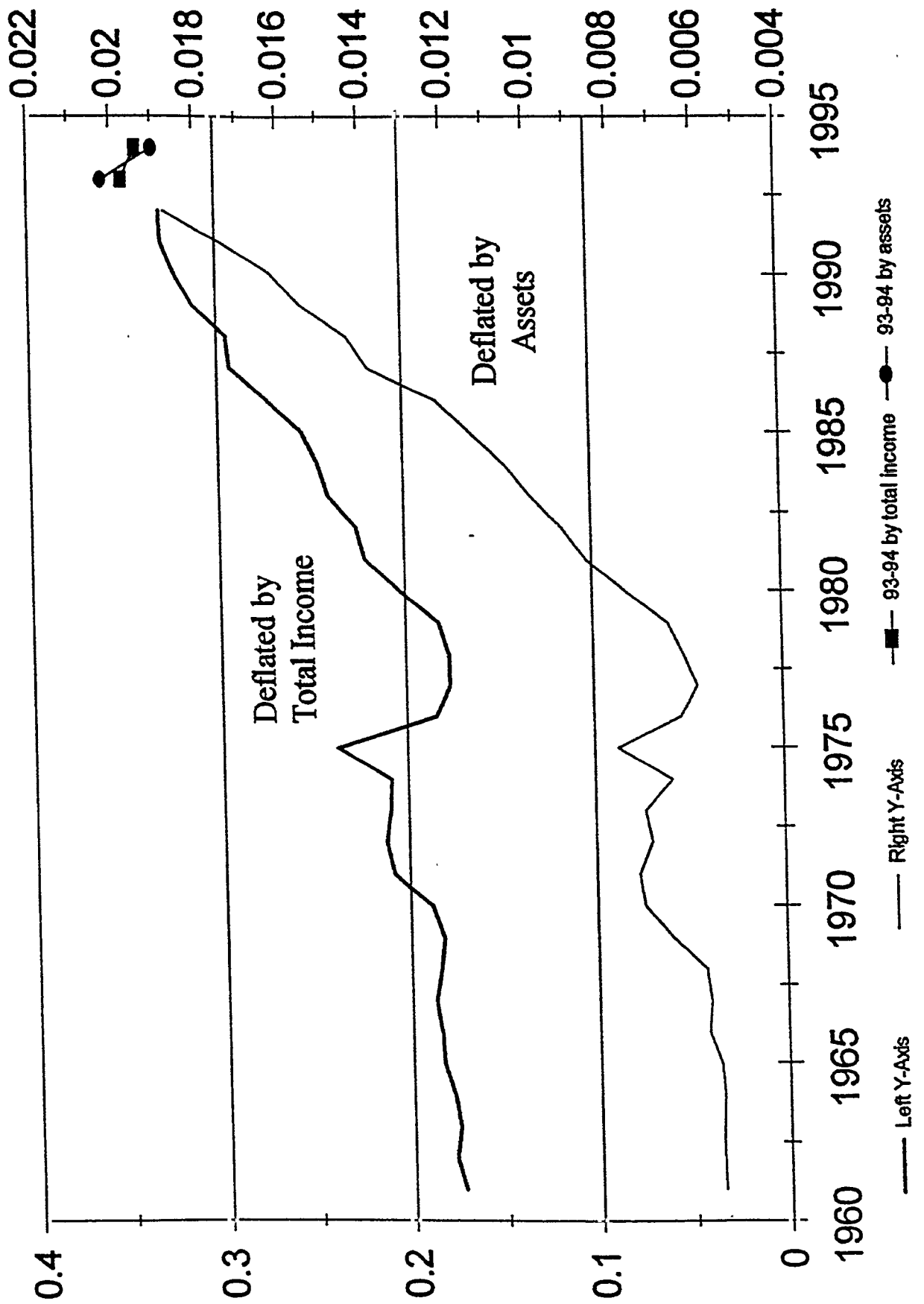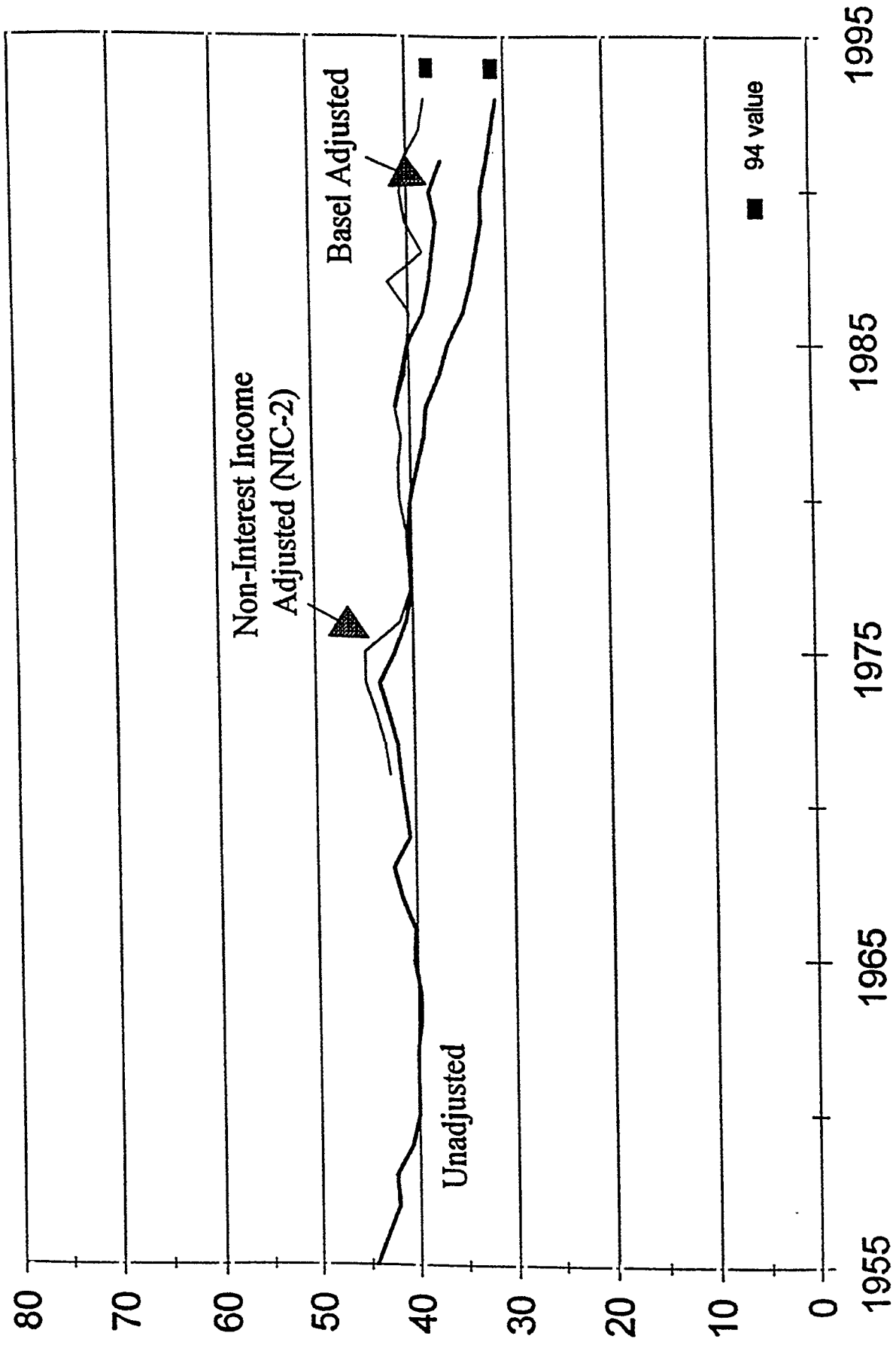Figure 2. Trends in Non-Interest Income of Banks

Figure 3. Commercial Banks' Share of Financial
Intermediation, Unadjusted and Adjusted

The Basel Adjusted Series employs balance sheet equivalents used by the regulator authorities in calculating capital requirements for off balance sheet risk exposures. The NIC-2 Adjusted Series capitalizes non-interest income (at the same rate as that earned on balance sheet assets). The Basel adjustment is "too small" for our purposes, since many off balance sheet activities are not included in it. See Boyd and Gertler (1993) for details.

Appendix A

Large Bank Failures[1]

1971–94

Year	Name of Bank	Year	Name of Bank
1972	Bank of the Commonwealth, Detroit	1990	Seamen's Bank for Savings, NY
1973	United States NB, San Diego		NB of Washington, DC
1974	Franklin NB, NY	1991	Bank of New England, Boston
1980	First Pennsylvania Bank, Philadelphia		Connecticut B&T, Hartford
1981	Greenwich SB, NY		Maine NB, Portland
	Union Dime SB, NY		Maine SB, Portland
1982	Western New York SB, Buffalo		First NB Toms River, NJ
	New York Bank for Savings, NY		Goldome, Buffalo
	Western Savings Fund Society of Philadelphia		First Mutual Bank for Savings, Boston
	Dry Dock SB, NY		Citytrust, Bridgeport, CT
1983	First NB of Midland, TX		Mechanics & Farmers SB, Bridgeport, CT
	Continental-Illinois NB&T, Chicago		Southeast Bank, Miami
1984	Bowery SB, NY		Connecticut SB, New Haven, CT
1985	First NB&T of Oklahoma City		Crossland SB, Brooklyn, NY
1986	Syracuse SB	1992	Dollar Dry Dock Bank, White Plains, NY
1987	First City Bank, Texas (2 banks)		American SB, White Plains, NY
1988	First Republic Bank, Texas (4 banks)		First Constitution Bank, New Haven CT
	Mbank, Texas (2 banks)		Howard SB, Newark, NJ
1989	Texas American Bank		First City Bank, TX (2 banks)
	First American B&T, North Palm Beach, FL		Merchants Bank, Kansas City, MO
			Heritage Bank for Savings, Holyoke, MA
			Meritor SB, Philadelphia

Source: FDIC *Statistics on Banking*. Historical 1934–1994, vol. I.

[1]Includes all commercial and savings banks with total assets or total deposits greater than $1 billion that were insured by the FDIC or BIF.

Appendix B

Names of Merging Banks and Year of Merger

Merger Date	Survivor Name	Merger Date	Survivor Name	Merger Date	Survivor Name
1989	Mineral King NB	1990	Reelfoot BK	1991	Frontier BK
	Bank North		Cleo St BK		Peoples BK of Cmrc
	Bank of San Diego		California St BK		North Cty BK
	Bank One OK City		First NB&TC		Valliwide BK
	Fairmont Bancorporation		Citizens St BK		United NE BK North Platte
	Summit BK of Muncie		Landmark BK		Liberty NB of Lexington
	Midamerica BK So		First NB of Central California		Farmers ST BK of Adams
	American B&TC		First ST BK		Piper Bshrs
	First Fidelity BK		Civicbank of CMRC		Community BK of TX
	Minnstar BK NA		First NB North Dakota		Bellingham NB
	Belmont NB		First Citizens NB		Horicon ST BK
	National BK of CMRC of MS		Farmers ST BK of Blue Mound		North BK
	First United BK		Nebraska ST B&TC		Caminoreal BK NA
	First Philson BK NA		Dubuque B&TC		Greenbrier Valley NB
	Capital BK		National Exchange B&T		First BK S
	North Shore BK of Commerce		Premier BK South NA		Liberty B&T
	Eldorado BK		State BK of Lincoln		Merchants NB of Winona
	First Central BK		F&M BK NE		State B&TC
	Farmers BK of Cook		Norwest Corp		Princeton BK
	Western BK		Farmers ST BK of Trimont		Peoples BK
	Sterling ST BK Austin MN		Twentieth Street BK		Lincoln Svg BK
	Peoples NB		Barnett BKS		Kansas St BK
	First BK KS		First NB		Central BK
	Pioneer B&TC		Armstrong BK		Hartland BK NA
	Orange BK		First NB		Citizens Bkg Co
	Morton Cmnty BK		West AL B&TC		Huntington Bshrs
	American NB of De Kalb Cty		Western NB		Triumph ST BK
	North Fort Worth BK		First Newton BK		Klossner Bancorporation
	First NB		Farmers NB of Danville		Bank Midwest NA
	Salin BK		Community SVG BK		First KS BK
	First NB		Platte Valley NB-Morrill		Green Mtn BK
	First NB of Hayes Ctr		Omnibank		Warren-Boynton ST BK
	One Valley BK East NA		Farmers BK		First Western BK Sturgis
	Rogers Cty BK		Southern California BK		Murray County ST BK
	Bay Hermann Berger BK		Louisiana NAT Security BK		UnionBank
	First NB of Jermyn		Bank of the West		Huntington ST BK
	Shelby ST BK		Farmers ST BK		Community BK
	United BK IA		Sun Security BK of Amer		First United BK
	Midway NB of St Paul		UMB Security ST BK		First NB Decatur
	Citizens ST BK of Clara City		First ST BK Taos		First NB in Cimarron
	Pinnacle BK		Heritage BK NA		Farmers NB of Geneseo
	Huntington BSHRS		First BK		Commercebank
	Ohio BK		Heartland BK		Central ST BK
	Sunflower BK NA		Windom ST BK		First Cmnty BK
	Stroud NB		Jewell Cty BK		Citizens & Northern BK
	Norwest BK TX Austin		Saline ST BK		Helena NB
	Siuslaw Valley BK		Triangle BK		Wood Cty NB
	First St BK of Ransom		Unibank		BK of New Haven
	Twinco		Tri Cty St BK of El Dorado Spr		First NB of Commerce
	Exchange NB		Commerce Bshrs		Peoples NB of Kingfisher
	Home B&TC of Eureka				United NB-North
	First BK				Emprise BK NA
	UMB Oklahoma BK				First Mid-IL B&T NA
					Security NB of Superior