Consolidation in the U.S. Banking Industry: Is the "Long, Strange Trip" About to End?

*by Kenneth D. Jones and Tim Critchfield**

In 1995, the Brookings Institution published a paper entitled "The Transformation of the U.S. Banking Industry: What a Long, Strange Trip It's Been."[1] Using a breathtaking array of facts and figures, the paper described in great detail the dramatic changes that had occurred in the U.S. commercial banking industry over the 15 years from 1979 to 1994. The banking industry was transformed during that period, according to the paper (p. 127), by "the massive reduction in the number of banking organizations; the significant increase in the number of failures; the dramatic rise in off-balance sheet activities; the major expansion in lending to U.S. corporations by foreign banks; the widespread adoption of ATMs; . . . and the opening up of interstate banking markets." The paper went on to explain that most of these major changes in banking could be traced to two developments: (1) the extraordinary number of major regulatory changes during the period, from deposit deregulation in the early 1980s to the relaxation of branching restrictions later in the decade; and (2) clearly identifiable innovations in technology and applied finance, including improvements in information processing and telecommunication technologies, the securitization and sale of bank loans, and the development of derivatives markets.

Other research would later confirm the paper's assessments and its explanation of the course of events in the banking industry over the period 1979–1994.

Yet, nearly a decade after the publication of that paper, data indicate that the transformation of the banking industry is ongoing and that the number of banking organizations continues to decline—though recently there have been signs that the number of organizations is beginning to stabilize. In fact, when we take a closer look at the data, we find that the rate of decline in the number of banking organizations appears to be slowing markedly. Indeed, if the data from the past few years indicate anything about future direction, the rate of decline can be expected to slow even more over the next five-year period. Moreover, some evidence suggests that this slowdown in the rate of decline might presage a return to a relatively stable

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[1] Berger, Kashyap, and Scalise (1995).

population of banking organizations. Such a result would be in sharp contrast to conventional wisdom—which foresees continued consolidation of the banking industry in the United States.

Because this paper is part of a collective review of the U.S. banking industry's past and an anticipation of its future, many aspects of the industry's transformation are discussed in companion papers.[2] Our focus, therefore, is primarily on industry structure: how it has already changed and how it might evolve in the future. Accordingly, we begin with an updated review of the structural changes that occurred in the industry over the two decades 1984–2003. This should give us a better understanding of the scope of the decline that has taken place. We then review the causes of this decline and the literature on how the decline has affected such things as asset concentration, banking competition, efficiency, profitability, shareholder value, and the availability and pricing of banking services. After this analysis of the past, we offer some projections of future banking industry structure.

Overview of Structural Change in the U.S. Banking Industry 1984–2003

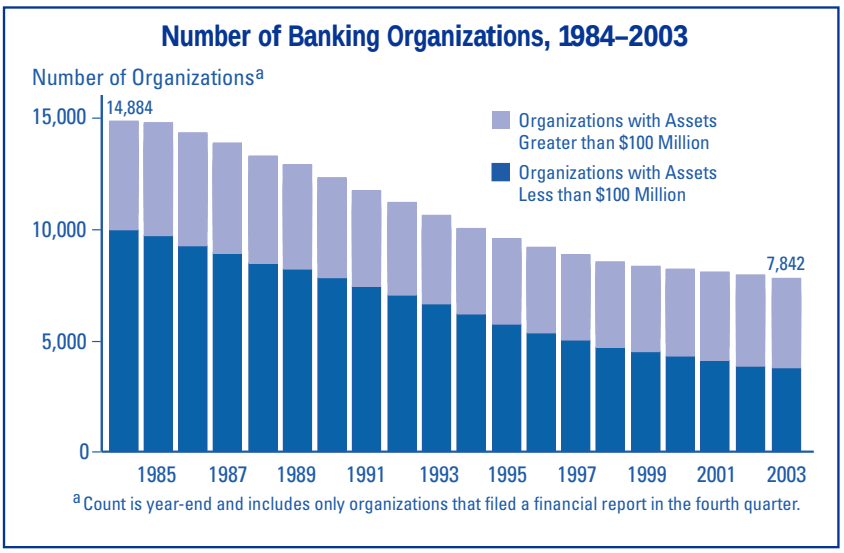
Over the two decades 1984–2003, the structure of the U.S. banking industry indeed underwent an almost unprecedented transformation—one marked by a substantial decline in the number of commercial banks and savings institutions and by a growing concentration of industry assets among a few dozen extremely large financial institutions. This is not news. As mentioned above, the decline in the number of banking organizations has been ongoing for more than two decades and has been well documented in the literature.[3] Nevertheless, a brief overview will serve to clarify both the scope of the decline and the increasing concentration of assets among the nation's largest banking organizations.[4]

[2] In 2004, the FDIC released its findings from a comprehensive research project looking into the future of banking. The study as a whole projects likely trends in the structure and performance of the banking industry and anticipates the policy issues that will confront the industry and the regulatory community in the coming years. Copies of the research papers making up the study can be obtained at http://www.fdic.gov/bank/analytical/future/index.html.

[3] Discussions about the declining number of banks can be found not only in the paper already mentioned (Berger, Kashyap, and Scalise [1995]) but also in Berger, Demsetz, and Strahan (1999); Hughes, Lang, Mester, and Moon (1999); and the Group of Ten (2001).

[4] Data limitations at the level of banking organizations restrict our analysis to the years 1984–2003. And because the number of commercial banks alone peaked in 1984 at 14,496, we use that year as the beginning of our discussion of the consolidation trend, even though in certain respects the transformation of the U.S. banking industry may be said to have begun earlier.

Figure 1



Industry Size

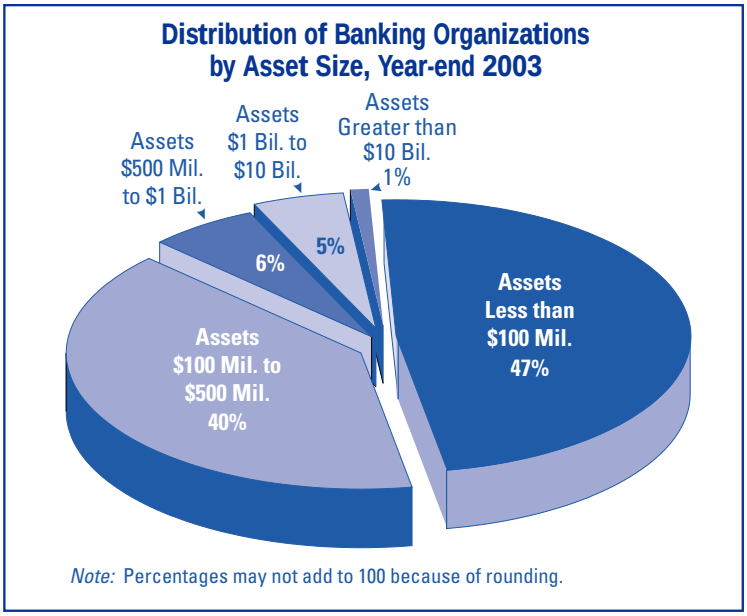
At year-end 1984, there were 15,084 banking and thrift organizations (defined as commercial bank and thrift holding companies, independent banks, and independent thrifts).[5] By year-end 2003, that number had fallen to 7,842—a decline of almost 48 percent (figure 1). Distributed by size, nearly all the decline occurred in the community bank sector (organizations with less than $1 billion in assets in 2002 dollars), and especially among the smallest size group (less than $100 million in assets in 2002 dollars).[6] Yet the community banking sector still accounts for 94 percent of banking organizations (figure 2).

Geographically, the decline in the number of banking organizations appears to have been remarkably uniform across a variety of regions and markets. Critchfield et al. (2004), for example, examined the decline of community banks across four market segments—rural markets, small metropolitan markets, and suburban and urban parts of large metropolitan markets—and found that the declines across all four markets were proportionally similar (figure 3). The dynamics underlying the declines, however, differed depending on the market. Rural areas, for example, saw proportionally fewer mergers and very little de novo entry in comparison with both small and large metro markets, where a larger number of mergers was partially offset by a larger number of new-bank start-ups.

Overall, the bulk of the decline in the number of organizations between year-end 1984 and year-end 2003 was due to unassisted mergers and acquisitions (see figure 4, which decomposes the net change in the number of banking organizations into several components).[7] In every year but one, mergers and acquisitions were the single largest contributor to the net decline in banking organizations.[8] During the entire period, 8,122 individual bank and thrift organizations disappeared through unassisted mergers and holding company purchases.

From 1985 through 1992, though, failures also contributed significantly to the decline in the number of banking organizations (figures 4 and 5). Of the 2,698 bank and thrift closings caused by failure during the entire period 1984–2003,[9] almost 75 percent of them occurred in the five years 1987–1991, when failures averaged

Figure 2



Note: Percentages may not add to 100 because of rounding.

[5] The expansion of banking powers over the period we are studying has left few differences between commercial banks and savings institutions (thrifts), so unless otherwise specified, our analysis combines the two types of institutions. Moreover, we focus on top-tier organizations rather than on individual institutions in order to avoid counting multiple charters belonging to a single corporate entity. The count here for year-end 1984 (15,084) includes all active organizations, whereas figure 1 (which shows a total of 14,884 organizations for year-end 1984) includes only organizations that filed a financial report at the end of 1984.

[6] Asset size classes have been adjusted for inflation using the GDP price deflator with 2002 as the base year. Hence, the number of banks in 2003 that had less than $100 million in assets is comparable to the number of banks in 1984 that had less than $66 million in assets.

[7] "Other additions" included in figure 4 were non-FDIC-insured institutions that became FDIC-insured, often transferring from state insurance programs in the mid-1980s. "Other changes" were voluntary liquidations of organizations.

[8] The sole exception was 1989, when the savings and loan (S&L) and banking crises were near their peak.

[9] This number includes not only 2,262 organizations (including multibank holding companies) that were eliminated because of failure but also individual charters that were merged into other charters with FDIC assistance; however, it does not include insolvent institutions that remained open with FDIC financial assistance.

388 per year.[10] In contrast, from 1994 to 2003 only 66 institutions failed—a figure that reflects greatly improved economic conditions and stronger safety-and-soundness regulation.

The decline caused by mergers, acquisitions, and failures was partially offset by the entry of 3,097 new banking organizations between year-end 1984 and year-end 2003. This number is remarkable, given the overriding downward trend. During the entire period, the number of de novo bank entrants averaged 163 per year, even though the creation of new banks was suppressed at the height of the thrift and banking crises. The number of start-up institutions peaked in 1984, then declined each year until 1993; then, as economic conditions improved and more capital became available, de novo entry into the banking industry resumed and continued through the end of the century.

Figure 3

Percentage Decline in the Number of Commercial Banks, 1985–2003 (Unit- vs. Non-Unit-Bank States and across Various Types of Markets)

Source: Critchfield et al. (2004).

With the beginning of an economic recession in March 2001, the number of new charter formations again began decreasing.

As indicated by the trends in mergers, acquisitions, and failures on the one hand, and start-ups on the other hand, the pace of the decline in the number of banking organizations has not been uniform. Indeed, graphing the rate of change reveals a very strong cyclical pattern, with declines occurring at a rate that increased in the 1980s, only to slow in the 1990s (figure 6). Since 1992 the rate of decline in the number of institutions has trended consistently lower. (This pattern has important implications for our projections of the structure of the industry.)

Industry Concentration

At the same time that the number of banking organizations was decreasing, industry assets were increasing. Over the 1984–2003 period, banking industry assets grew from $3.3 trillion to $9.1 trillion—a increase of nearly 70 percent in real terms.[11] Existing assets and asset growth,

[10] The number of failures peaked in 1989, when 536 banks and thrift institutions failed.

[11] We determined real growth by adjusting nominal dollars for inflation using the GDP chain-type price deflator, with 2002 selected as the base year.

Figure 4

Change in the Number of Banking Organizations,1985 to 2003

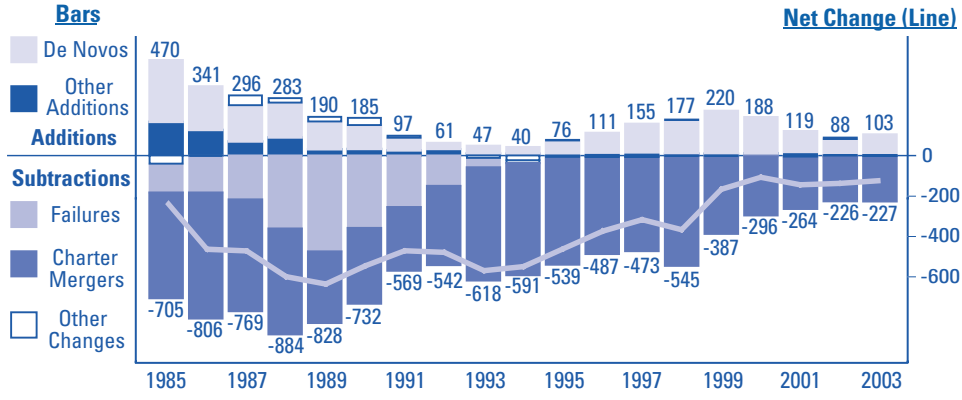


Figure 5

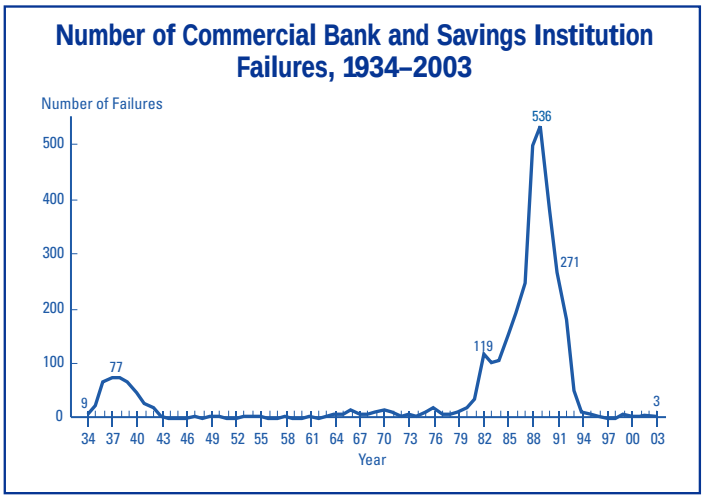


Figure 6

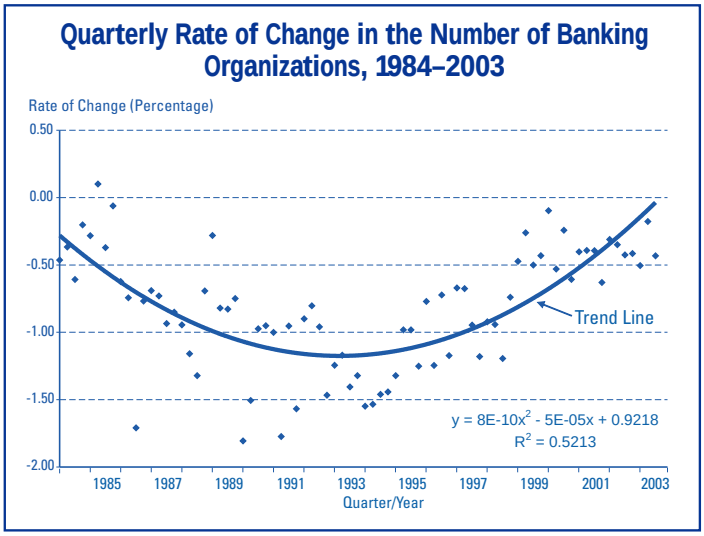
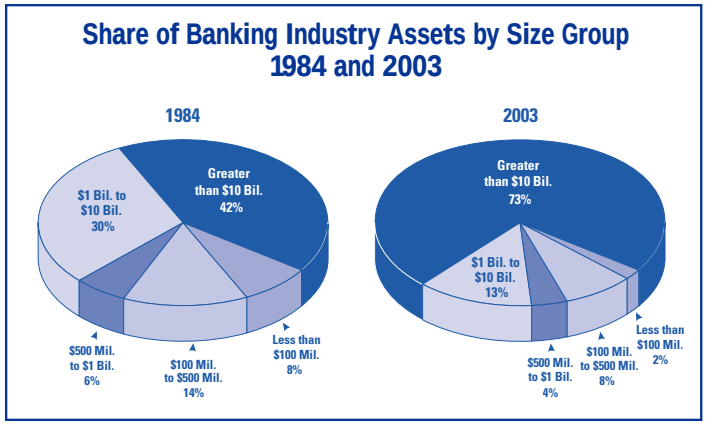


Figure 7



however, were not evenly distributed across the industry but, instead, were becoming more and more concentrated among the nation's largest financial institutions. This trend can be seen in figure 7, which compares asset share over time for each of five size groups during our period. The asset share of the largest size group—organizations with more than $10 billion in assets—increased dramatically, rising from 42 percent in 1984 to 73 percent in 2003. In contrast, the share of industry assets held by community banks (organizations with less than $1 billion of assets) dropped from 28 percent in 1984 to only 14 percent in 2003; and the smallest banks, organizations with less than $100 million in assets, accounted as a group for only 2 percent of industry assets in 2003—compared with 8 percent in 1984.

In terms of deposits, industry concentration has been equally dramatic: a quarter of the nation's domestic deposits are now controlled by just 3 organizations (see table A.1), whereas in 1984 that same proportion was held by 42 companies. At year-end 2003, Bank of America Corporation, the largest holder of domestic bank deposits, held approximately $512 billion in domestic deposits (9.8 percent of the industry) and had $870 billion in assets (9.6 percent of the industry).[12] Also at year-end 2003, the 3,683 banking organizations that each held less than $100 million in assets accounted as a group for only $192 billion of industry assets (2 percent, as noted above) and $160 billion (3 percent) of domestic deposits.

Analyzing banking industry concentration, Moore and Siems (1998) and Rhoades (2000) found that, despite some recent

[12] In October 2003, Bank of America announced that it would acquire the nation's eighth-largest bank–FleetBoston Financial–in a $47 billion all-stock transaction. Our numbers are for the combined organization based on year-end 2003 data.

increases, national and local measures of concentration had remained, on average, relatively low.[13] This was surprising, given that many mergers had been of the within-market type—those most likely to result in increases in concentration. Hence, despite the heightened merger activity among banks over the two decades 1984–2003, it appears that current concentration measures generally remain below the level where monopolistic behavior might manifest itself. Part of the reason may be that deregulatory efforts to lower entry barriers and expand bank powers—helped along by advances in technology—have resulted in an expanded geographic reach of competitors. Competition from nonbank financial market participants also provides an important check on market power. However, Rhoades (2000) does caution that, although MSA (metropolitan statistical area) market concentration remains fairly low on average, it has nonetheless increased substantially since 1984, and the increase suggests that in the future there is likely to be a growing number of MSA markets in which bank merger proposals raise significant competitive issues.

Fundamental Causes of Consolidation

Naturally policy makers, academics, and others have wanted to know the "why" of consolidation. Why, after decades of seeming to change so little, did the industry begin to consolidate and restructure itself so dramatically? There is no single reason for the consolidation trend and no single underlying cause. Rather, the trend might best be viewed as the result of a combination of macro- and microeconomic factors: external forces that fundamentally and irrevocably changed the environment in which banks operated, and banks' strategic responses to those environmental forces (ostensibly with the goal of maximizing shareholder value). Previous studies of the consolidation phenomenon have examined and discussed the various factors at considerable length. Berger, Kashyap, and Scalise (1995), Berger, Demsetz, and Strahan (1999), and Shull and Hanweck (2001), in particular, offer broad reviews of the literature.[14]

Environmental Factors

At the macroeconomic level, consolidation has been driven by exogenous changes in the banking industry's economic environment, and these changes have often worked in concert to encourage consolidation. Foremost among them have been globalization of the marketplace, technological change, deregulation, and major macroeconomic events (such as the thrift and banking crises of the 1980s and the early 1990s, and the economic and stock market boom of the late 1990s). Globalization and technological change have been persistent forces for change over the entire period, and deregulation (in its various manifestations) has been a recurring enabling force. In contrast, the strength and influence of major macroeconomic events have varied over time. For example, the economic forces that led to the thrift and banking crises were influential primarily in the middle to late 1980s and early 1990s; by the mid-1990s the crises were over, and bank and thrift failures were no longer a major contributor to industry consolidation. Similarly, the influence of the economic growth and stock market boom of the late 1990s was largely restricted to a specific period. Hence, adding a temporal dimension to the discussion of the external influences on consolidation will help us not only understand the current trend but also formulate expectations about the future.

Globalization and Technology. Globalization began slowly in the aftermath of World War II. After that war, the major economies of the world gradually became more connected and interdependent,

[13] Standard measures of concentration include the Herfindahl-Hirschmann Index (HHI–defined as the sum of the squares of the individual market shares of all banks in the market) and the three-firm concentration ratio (CR3–that is, the percentage of deposits accounted for by the three largest banking organizations in the market).

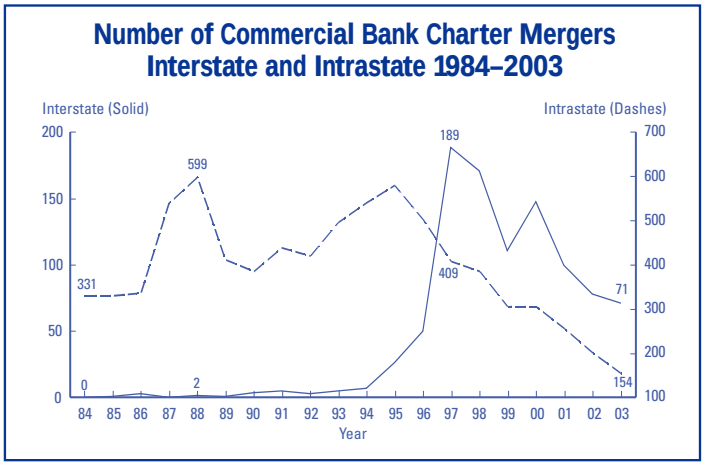
[14] Expanded discussions of the macroeconomic forces driving consolidation can also be found in Rhoades (2000); Hannan and Rhoades (1992); and Boyd and Graham (1998). The microeconomic underpinnings of banking consolidation are discussed in Hughes, Lang, Mester, Moon, and Pagano (2003), Milbourn, Boot, and Thakor (1999), Calomiris and Karceski (1998), and Hughes, Lang, Mester, and Moon (1996).

This trend toward globalization accelerated in the 1970s and 1980s—in tandem with the beginnings of what would become a revolution in information and telecommunication (ITC) technologies. Indeed, by the end of the twentieth century, technological change would affect nearly every aspect of the business of banking: the demand for banking services, the character and intensity of sector competition, and the very structure of the industry.[15] Through what has been described as "a protracted series of technology shocks with order-of-magnitude effects on the costs of transmitting and processing information," advances in ITC technologies have created new advantages of scale in production and have lowered barriers to entry.[16]

Dramatically lowered costs and the ability to transmit information almost instantaneously around the globe effectively freed the financial services industry from the constraints of time and place. In the new global financial economy, banks, securities firms, corporations, and even individual investors became able to transfer huge amounts of capital around the globe with the click of a mouse. Yet, while these new technologies enabled financial firms of all types to exploit innovations in financial and economic theory, engineer new products, and implement new techniques for managing risk, they also resulted in a sharply more competitive marketplace for banking and financial services. To survive and prosper, banking organizations needed to respond to this new environment. Consolidation was one response. However, the strict regulatory environment that existed before the 1980s largely precluded any dramatic consolidation within the banking industry. Not until regulatory constraints were relaxed did consolidation of the banking industry begin in earnest.

Deregulation. In the early 1980s, policy makers began a decades-long process of deregulating the banking and thrift industries so that they could be more responsive to marketplace realities (see table A.2). Over time, these legislative and other deregulatory efforts gradually (albeit haltingly) loosened the constraints on the industry, thus freeing it to cope more effectively with both the new environmental challenges and the heightened competition that resulted. In two areas—banking activities and branching—legislative and regulatory efforts were particularly important for the consolidation trend: restrictions on permissible banking activities were relaxed, and geographic limitations on branching were removed. The importance of these two efforts is perhaps best illustrated by the spate of interstate mergers that occurred immediately after passage of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 (figure 8). Although some researchers have argued that much of the merger activity associated with the deregulatory process reflected only pent-up demand that had been long accumulating because of other causal factors, there can be no doubt about the influence of deregulation on the merg-

Figure 8



[15] For more detailed discussions of technology and the effects it has had on the restructuring of the financial services sector, see Berger (2003), Berger and DeYoung (2002), the Group of Ten (2001), Hunter (2001), Mishkin and Strahan (1999), and Emmons and Greenbaum (1998).

[16] Emmons and Greenbaum (1998), 37.

er wave as it unfolded in the United States: if deregulation in and of itself was not a primary causal factor, it was certainly an essential enabling factor.[17]

Macroeconomic Events. In the 1970s—even before deregulation and before the full effects of the revolution in ITC technologies had been felt—a series of macroeconomic shocks combined with the twin forces of globalization and technology to dramatically alter the economic environment within which banks operated. Indeed, the decade of the 1970s saw the introduction of floating exchange rates, increased volatility in interest rates, oil price shocks, stagflation, and unexpected changes in other real economic and financial variables. These economic conditions, and governmental responses to them, began putting stress on the environment in which banks and thrifts had successfully operated, unchanged, for many decades.

In the early 1980s these stresses were intensified by double-digit inflation and then by the anti-inflationary monetary policies designed to combat it. By mid-decade, wild swings in interest rates, combined with sharp declines in oil and gas prices and in the value of real estate, precipitated a series of rolling regional recessions that wreaked havoc on the nation's S&L and banking industries. The number of failures soared, soon reaching (and then far exceeding) levels that had not been seen since the Great Depression. But as bank failures rose to record levels, so did bank mergers and acquisitions: federal regulators responded to the growing number of weak and failing depository institutions and shrinking insurance-fund balances by loosening their restrictions on mergers. The FDIC even provided financial support to encourage better-capitalized and profitable banking organizations to acquire weakened or insolvent institutions. As a result, during the 1980s the consolidation movement was particularly strong.

* * *

The consolidation of the banking industry continued into, and then through, the 1990s, but it is important to note that the forces driving the trend in the 1990s differed markedly from the forces driving it in the 1980s. Indeed, in many respects the 1980s and the 1990s were the worst of times and the best of times (respectively) for the banking industry. Banks in the 1980s were struggling under harshly unfavorable economic conditions and outdated legislative and regulatory constraints. Many banks and S&L were unprofitable. Many failed. In contrast, the middle to late 1990s saw a convergence of several factors that created an environment extremely conducive to merger activity. First, unlike the 1980s, the middle to late 1990s were a period when banks were highly profitable, flush with cash, and reveling in favorable economic and interest-rate environments. In fact, bank performance from 1993 through the end of the decade (and beyond) would set multiple records for profitability (figures 9 and 10). Second, Riegle-Neal's removal of barriers to interstate banking and branching provided opportunities for many organizations to consolidate operations and pursue geographic diversification through acquisitions. Third, a record-breaking bull market in stocks pushed market valuations of banks and thrifts to unprecedented levels, encouraging many banking firms to use their stock as currency to purchase the hard assets of other banking firms (figure 11). This was especially the case when managers believed their firms' own stocks were "favorably" priced. Conversely, managers of firms wishing to be acquired were able to maximize firm value by selling out at record market-to-book valuations. While these conditions persisted, consolidation continued at a relatively rapid pace—although it was partially offset by a rise in the number of new bank start-ups.

At the end of the decade, however, several events appeared to have had a markedly dampening effect on bank merger activity and on the pace of indus-

[17] As mentioned, the Riegle-Neal Act (along with regional interstate compacts that repealed interstate branching restrictions) had a significant effect on bank merger activity and industry consolidation. In contrast, the latest legislative initiative aimed at modernizing the financial services industry–the Gramm-Leach-Bliley Act of 1999 (GLB)–has not had a similar effect. As explained by Rhoades (2000), GLB provides for cross-industry mergers between banks, securities firms, and insurance companies. However, such combinations are likely to be considered by only the largest banking organizations. Moreover, by definition, the combination of a banking firm and another type of financial services provider does not result in the loss of a bank charter. Hence, the combination will have no effect on the number of banking organizations.

Figure 9

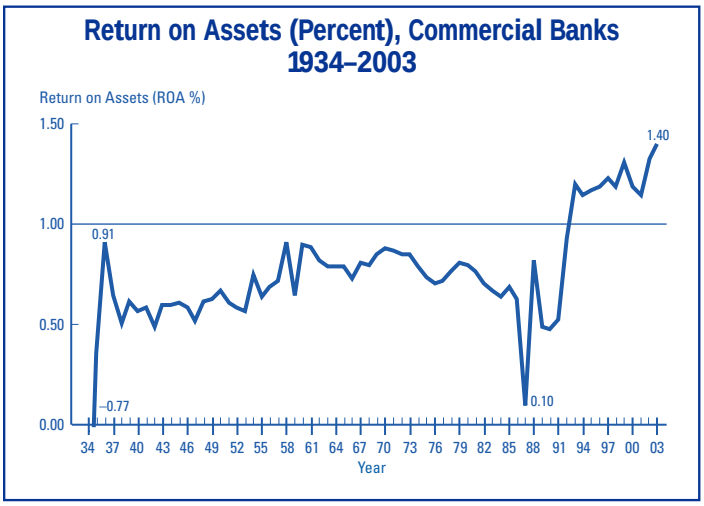


Figure 10

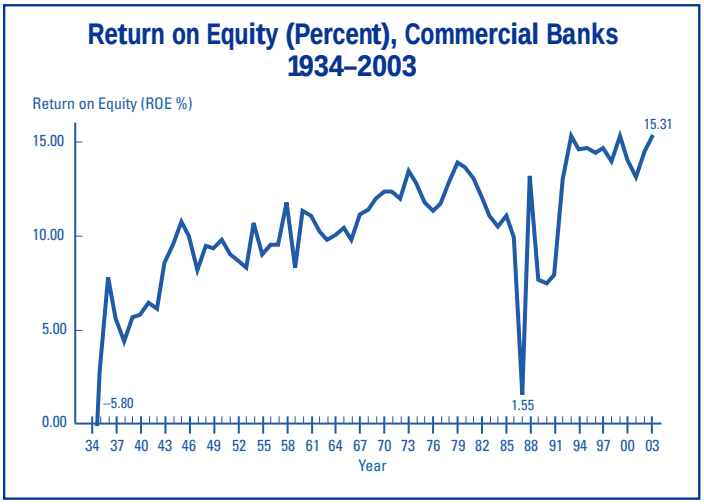
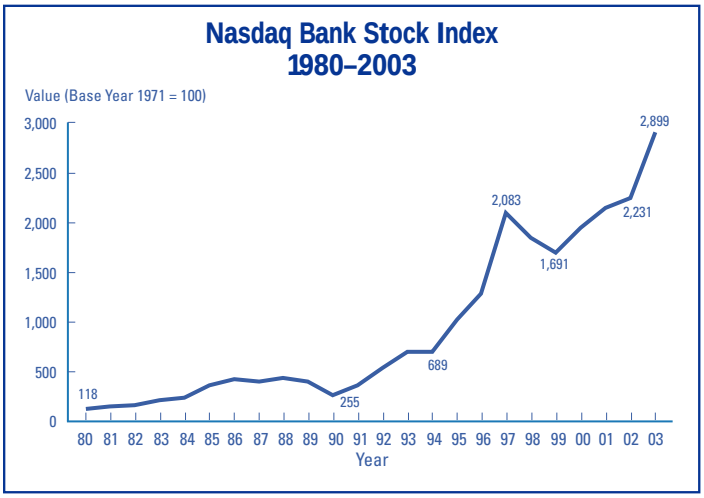


Figure 11



try consolidation. First, Y2K-related concerns might have caused some merger plans to be postponed until after the beginning of the new millennium. Then in March 2000 the record run-up in stock prices reversed itself.[18] A year later (in March 2001) the U.S. economy entered a mild recession. Coincident with these adverse economic developments, a significant accounting change in the way mergers were recorded served to discourage stock-funded bank merger transactions.[19] Finally, the terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, and the subsequent wars in Afghanistan and Iraq adversely affected the broader economic and business environments. Nevertheless, consolidation in the banking industry continued into the twenty-first century, though at a much slower rate.

Microeconomic Factors in Merger Decisions

As we have just seen, at the macroeconomic level consolidation has been influenced by technology, deregulation, macroeconomic events, and other environmental factors. But it is the microeconomic factors that, in the aggregate, are largely responsible for the consolidation trend. These factors are the individual decisions by banking firms to pursue a merger or acquisition strategy. From a microeconomic perspective, a bank's decision to consolidate charters—to merge with or acquire another firm—should reflect management's

[18] For the next several years, all the major stock indexes would fall dramatically; from March 2000 to March 2003, for example, the S&P 500 benchmark fell a cumulative 43 percent.

[19] Financial Accounting Standards Rule 141 (FAS 141) terminated the use of pooling-of-interest accounting for business combinations after 2001 and required that purchase accounting methodology be used instead. Purchase accounting requires a firm to record goodwill if the market value of net assets acquired is less than the purchase price. Historically goodwill was amortized regularly, but now (under FAS 142) companies must test goodwill (and other intangibles) for impairment once each fiscal year. A finding of impairment may require additional noninterest-expense recognition.

chosen strategy for maximizing or preserving firm value in the face of increased competitive pressure stemming from a more market-oriented environment. For example, a merger strategy can be based on value-maximizing motives, such as achieving economies of scale and scope or reducing risk or increasing profits through geographic and product diversification. Indeed, in a recent survey of bank management, value-maximizing motives were most often cited as the principal reason to undertake a merger.[20]

A firm's decision to merge, however, may also be influenced by motives that do not necessarily maximize the firm's value. Adverse changes in a bank's competitive environment may compel a banking firm to undertake an acquisition as part of a purely defensive strategy, or merger decisions may be based wholly or partly on the self-serving motives of managers. (Bliss and Rosen [2001] and Ryan [1999], for example, suggest that empire building and increased managerial compensation might be the primary motive behind some bank mergers.) Another motive—suggested by Shull and Hanweck (2001), Penas and Unal (2004), and others—is a desire to obtain "too-big-to-fail" status and the funding and other competitive advantages that seem to accrue to the largest and most complex banking organizations.

Just as economic and regulatory conditions in the 1980s differed significantly from those in the 1990s, some economists have suggested that the motivations behind bank mergers in the 1980s were different from the motivations behind the mergers of the 1990s. Berger (1998, 106) observes that

> Consistent with a change in merger motives, many of the merger participants in the 1980s focused on expanding their geographic bases to gain strategic long-run advantage by getting footholds in new locations, rather than on reducing costs or raising profits in the short run. Merger participants in the 1990s appear to be more focused on cutting costs quickly through mergers—for example, they often announce goals for employee layoffs, branch closings, and total cost savings in advance of mergers.

It may well be that merger motives have changed over time. Additional research will undoubtedly help us better understand if this is so.

The Effects of Consolidation

Perhaps more important than knowing why consolidation has occurred in the U.S. banking industry is understanding what its effects have been on the banking industry, its shareholders, and the customers served. In theory, globalization, technology, and deregulation should have resulted in a significant increase in competition. Increased competition, in turn, should drive value-maximizing managers to seek greater efficiencies through consolidation. In other words, if profit-oriented managers think that there are economies of scale or scope to be gained or that opportunities exist to replace inefficient managers at other firms or to enhance profitability by servicing customers better, a competitive environment will encourage these managers to seek such economies or opportunities. Of course, the question of whether the current consolidation trend has made the banking industry more efficient or a better provider of services to the banking public is an empirical one.

Fortunately, the effects of consolidation have been a particularly active area of empirical research for more than a decade, and a consensus is beginning to form. Table A.3 gives a synopsis of these general findings. However, we should first note that researchers have faced substantial econometric difficulties in their attempts to test for efficiency and other potential gains from consolidation. Pilloff and Santomero (1998) and Calomiris and Karceski (1998), in particular, have enumerated several methodological pitfalls that make it hard to assess the effects of consolidation accurately. Among the pitfalls are these: (1) because of increased competition, efficiency gains from mergers might not be reflected in net earnings; (2) lags in performance improvement may be extensive (three to five years), especially for mergers motivated by strategic

[20] Group of Ten (2001).

goals such as diversification rather than by a desire to cut costs; (3) constructing a believable benchmark (for purposes of comparison) in the midst of a merger wave may be difficult; and (4) controlling for multiple causal and motivational factors over time and across mergers may be difficult. In addition to these methodological difficulties, there is also likely to be a problem reconciling the findings of studies based on 1980s data with the findings of studies that use 1990s data. Furthermore, as our chronological account indicates, the causal factors (and probably the motivations) driving mergers in the 1990s were very different from those driving mergers in the 1980s. With these qualifications in mind, we now briefly summarize the existing evidence about the effects of consolidation.

On the positive side, findings to date suggest that consolidation has resulted in somewhat greater profit efficiency (profit efficiency measures how close a bank is to earning the maximum profits that a best-practice bank would earn under the same circumstances).[21] According to Berger (1998), profit efficiency is enhanced by mergers because the combined firms generally achieve greater diversification of their risk exposures through a better mix of geographic areas, industries, loan types, and maturity structures. In turn, improved diversification might allow the combined banking organization to undertake a portfolio shift from security investments into consumer and business loans—activities with higher expected values. Hence, profit efficiency would be greater with consolidation because capital is put to better use and because greater geographic diversification tends to reduce risk.[22]

Findings to date also suggest somewhat greater payment-system efficiency (see Hancock, Humphrey, and Wilcox [1999] and Adams, Bauer, and Sickles [2002]) and, for institutions that have increased their geographic diversification, possibly a lower risk of insolvency (Group of Ten [2001] and Berger and DeYoung [2001]). Finally, a potential negative effect of the reduced number of banking organizations has been avoided: access to banking services (including lending to small businesses) seems to have been relatively unaffected (see, for example, Avery et al. [1999], DeYoung et al. [1998], and Jayaratne and Wolken [1999]).

On the other hand, most researchers—especially those focusing on the 1980s and early 1990s—have not been able to identify any of the broad-based improvements in cost efficiency that one might have expected from economies of scale or scope.[23] Given that managers most often cite gains from increased cost efficiency as the primary motivation for strategic consolidations, this finding (or the lack thereof) represents a fairly substantial puzzle. Some researchers have tried to explain away the lack of support for economies of scale by citing measurement and econometric difficulties and a time horizon too short for making observations. And in fact, a few more-recent studies that claim to have overcome some of these obstacles have reported results suggesting that scale-related efficiency gains in the 1990s have been substantial (Hughes, Mester, and Moon [2001] and Hughes, Mester, and Moon [1999], among others). Additional investigations into gains in efficiency will undoubtedly help solve this puzzle.

In addition to lacking consensus on cost-efficiency gains, empirical work to date has also failed to find substantive evidence of other benefits that one might hope consolidation would yield. For example, there is little evidence that either consumers or shareholders have benefited from consolidation in the industry (Shull and Hanweck [2001], Kahn, Pennachi, and Sopranzetti [2001], and Prager and Hannan [1998]). Rather, there is growing evidence that increases in market power at the local level may be adversely affecting consumer prices (for both depositors and borrowers).[24] And as we mention above, there is also some evidence that

[21] Berger's (1998), concept of profit efficiency includes not only the cost-efficiency effects of mergers and acquisitions but also the revenue effects of changes in output that occur after a merger.

[22] For additional evidence on increased profit efficiencies, see Akhavein, Berger, and Humphrey (1997) and Boyd and Graham (1998).

[23] A number of studies have found little or no evidence of scale economies. These include Stiroh (2000) and Berger, Demsetz, and Strahan (1999). Additional studies with similar findings are listed in table A.3. For the findings on scope economies, see Stiroh (2004), Amel et al. (2002), DeLong (2001), and Demsetz and Strahan (1997), among others.

[24] See Shull and Hanweck (2001), and Berger, Demsetz, and Strahan (1999), among others.

managers may be pursuing mergers and acquisitions for reasons other than maximizing firm value: researchers who have studied the issue have consistently found support for the idea that empire building and increased managerial compensation are often primary motives behind bank mergers.[25] Finally, findings from several researchers suggest that industry consolidation and the emergence of large, complex banking organizations have probably increased systemic risk in the banking system and exacerbated the too-big-to-fail problem in banking.[26]

Thus, despite the many empirical studies of consolidation in the U.S. banking industry, much uncertainty remains not only about the importance of the various factors behind the merger trend but also about the effects of consolidation on bank shareholders and on those who use banking services. Before we can fully understand either the causes of consolidation or all its ramifications, more work needs to be done.

Projections of Banking Industry Structure

Because banks play an important role in the U.S. financial system, changes in the industry's structure are likely to have widespread effects. Hence, for planning purposes it would be useful if structural changes could be anticipated before they occurred.

Review of Previous Projections and Their Methodologies

Of the studies that have documented and discussed the decline in the number of banks, several—including Hannan and Rhoades (1992), Nolle (1995), Berger, Kashyap, and Scalise (1995), and Robertson (2001)—have also projected the future size and structure of the banking industry. Most of these projections are based on linear extrapolations from past trends. Although these studies all use somewhat different approaches, they all predicted a sharp decline in the number of commercial banking organizations through the decade of the 1990s and beyond.[27]

In the earliest of these papers, Hannan and Rhoades (1992) approached the task of projecting future U.S. commercial banking structure by assuming that the national trend would follow past responses to the relaxation of interstate banking regulations at the regional level. Accordingly, the authors examined more closely the structural transition to interstate branching experienced by the Southeast and New England over the period 1980–1989.[28] The authors approximated linear trends for each region by calculating an average annual rate of change in the number of commercial banking organizations for the period studied (and for the subperiod 1984–1989). They then assumed that the number of commercial banking organizations in the nation starting in 1989 would change at the rate that had been observed in the two regions. This method projected the number of commercial banking organizations in the United States to be in the range of 5,000 to 6,000 by the year 2010 (depending on the region and period used). For comparative purposes, the authors also based projections on extrapolations from national trends. This resulted in a projection of just over 5,000 commercial banking organizations by 2010.

In addition to extrapolating from regional and national trends, the authors also extrapolated from the banking structure observed in the state of California, where intrastate branching had been allowed since 1908. The commercial banking structure in California, they reasoned, would represent a sort of equilibrium case since the structure there had evolved in the absence of branching restrictions over a long period of time. In this

[25] See, for example, Hughes, Lang, Mester, Moon, and Pagano (2003), Bliss and Rosen (2001), and Gorton and Rosen (1995).
[26] Support for the too-big-to-fail motive is found in Shull and Hanweck (2001), Penas and Unal (2004), and Kane (2000). Studies on systemic risk include De Nicola and Kwast (2002) and Saunders and Wilson (1999).
[27] To the best of our knowledge, all previous studies excluded thrift organizations and projected only the numbers of commercial banking organizations or institutions.
[28] Nolle (1995) reports that by 1984, most of the six New England states had established reciprocal arrangements allowing bank holding companies to own (typically through acquisition) banking subsidiaries in another New England state; by 1987, all six states were participating in these arrangements. Similarly, by 1985 most of the states in the southeastern region of the country had accepted reciprocal arrangements, and by 1988 all of them had.

extrapolation, the authors assumed that once all geographic restrictions on branching were lifted, the ratio of commercial banking organizations to bank deposits nationwide would approach the ratio already observed in California. Projections to 2010 based on this approach varied depending on the period used to formulate the trend. However, according to the authors the most realistic projection indicated that the U.S. banking industry would eventually shrink to about 3,500 commercial banking organizations.[29]

Given the range of predictions yielded by the different cases, Hannan and Rhoades eventually offered a "best-guess" projection for the year 2010 of 5,500 commercial banking organizations. Regardless of methodology, however, all extrapolations suggested that, even with a continuation of the decline, the long-run equilibrium banking structure in the United States would probably consist of a very large number of banking organizations.

Nolle's 1995 paper likewise attempted to simulate the possible effects on the U.S. banking structure of liberalizing interstate branching restrictions. Using data on the state-by-state pattern of mergers, failures, and entries over the seven-year period 1987–1993, Nolle mechanically projected the number of commercial banks (individually chartered institutions) through the end of the year 2000. He considered two scenarios: an extrapolation from past trends under the assumption that legislation allowing nationwide interstate branching would not be enacted, and a judgmental adjustment of the first scenario assuming that interstate branching legislation would be passed in 1994 and fully enacted by midyear 1997 (this latter scenario proved to be historically accurate).[30] Results from the first scenario (the no-interstate-branching case) indicated a decrease of just under 2,100 banks (to 8,798 institutions) during the period 1994–2000—a decrease equal to about two-thirds of the amount of consolidation observed over the 1987–1993 period. The second extrapolation (the interstate-branching case) suggested that the total additional effect on consolidation of interstate branching would be an additional decline of about 1,000 banks (resulting in an industry total of 7,787 commercial banks in the year 2000). Given these results, Nolle concluded that interstate branching would not fundamentally alter the structure of the nation's commercial banking industry; that is, there would still be thousands of commercial banks and thousands of bank holding companies in existence at the turn of the millennium.

A conclusion similar to those reached by Rhoades and Hannan (1992) and Nolle (1995) was reached by Berger, Kashyap, and Scalise (BKS, 1995) as well, but they used a much more complex methodology. To quantify the possible effects of the removal of all state and federal restrictions on interstate branch banking, BKS constructed an econometric model to explain the distribution of domestic commercial bank assets across organization size classes on a state-by-state basis. In their model, the proportion of banking assets in each size class was assumed to be a function of state demographic variables as well as of a number of independent variables that had been designed to capture differences in the existence and the lifting of regulatory restrictions on statewide and interstate branching as well as on multibank holding company acquisitions.

Using the regressions, BKS then simulated the effects of nationwide interstate banking for 5 years, 10 years, 25 years, and the long term, under two scenarios: first, assuming zero growth of gross domestic banking assets; second, assuming asset growth at the national trend rate over the sample period (1979–1994). For each scenario the authors assumed that nationwide banking occurred

[29] Extrapolations from the 1980–1989 period actually predicted a slight increase in the number of commercial banking organizations nationwide. The estimate of 3,500 organizations is based on the trend from 1984 to 1989.

[30] For his interstate branching scenario, Nolle assumed that no states would choose to opt out of interstate banking or branching provisions; that all multistate, multibank holding companies (MSMBHCs) in existence at midyear 1993 would still be in existence at midyear 1997, when interstate branching was assumed to be fully in effect; and that as a group these MSMBHCs would "branch up" 75 percent of their out-of-home-state subsidiary banks by year-end 2000.

immediately (in 1994); they therefore removed all variation among the explanatory variables related to the liberalization of geographic restrictions, except for variables capturing time-since-liberalization effects. These time-effect variables were adjusted for the number of years to be projected in the simulation. The changes in the predicted proportions for each size class for each state were then added to the actual proportions in 1994 to obtain the future value. The predicted shares of domestic banking assets for each size class were then aggregated across the 50 states to obtain a weighted average proportion of assets in each size class at the national level. Finally, BKS obtained an estimate of the number of commercial banking organizations in each size class by dividing the projected total dollar value of assets in each size class by the average size of organizations in that size class in 1994.

Results from the zero-growth simulations indicated that "the removal of all geographic barriers to nationwide banking was likely to result in continued substantial consolidation of the banking industry."[31] Specifically, in this scenario the model predicted that the number of commercial banking organizations would fall by almost 4,000 by 1999, from a total of 7,926 to 4,106—a decline of almost 50 percent over five years. Surprisingly, little change was predicted to occur after 1999. When gross domestic assets were allowed to grow at trend rates, the predicted increase in consolidation in the first five years due to enactment of interstate branching was even greater: the number of commercial banking organizations falls to 3,440. In contrast to the zero-growth simulation—which predicted little consolidation after the first five years—the growth simulation projected the number of organizations as continuing to fall. Under this scenario the number of banking organizations falls to 1,939 in 25 years—a decline of 76 percent from 1994 levels. Notwithstanding these reductions, BKS's simulations still predicted that the banking structure in the United States would be characterized by thousands of small banking organizations. This finding was consistent with the findings of Hannan and Rhoades (1992) and Nolle (1995).

Finally, Robertson (2001) projected the number of commercial banking organizations in each size class by first calculating a transition matrix that indicated the probability that a bank would remain in the same size class from one year to the next, move to a new size class, or leave the industry altogether. After confirming matrix stability, he then applied the transition probabilities from the 1994–2000 transition matrix to the year-end 2000 numbers to obtain estimates for the industry's future size distribution. On the basis of this methodology, Robertson predicted that the number of commercial banking organizations would continue to decline—from 6,750 in 2000 to 4,567 in 2007, for a 32 percent reduction. Like the projections of earlier studies, Robertson's suggested that the number of smaller banking organizations would continue to fall steadily. Indeed, Robertson's simulation predicted that the number of banking organizations with less than $100 million in real assets would decline by nearly 40 percent over the seven-year period he was forecasting.

New Linear Extrapolations: A Comparison with the Literature

On the basis of earlier studies, then, it seems that we can expect to see further declines in the number of banking organizations, especially in the community banking sector (where the number of organizations with less than $100 million in assets is expected to continue to fall dramatically). Some of the aforementioned projections, however, are based on data that are more than a decade old. We show above that the decline in the number of banking organizations, while ongoing, has slowed appreciably in the last few years. This slowing should have important implications for expectations about the future structure of the banking industry. Consequently, we have formulated new projections of industry structure based on the latest observed trends.

As a starting point, we adhered to the linear approach to project the number of banking organizations in each of five size classes through the year

[31] Berger, Kashyap, and Scalise (1995), 113.

Table 1

Projected Number of Banking Organizations, 2003–2013
By GDP-Deflated Asset Class

Number of Organizations	Assets < $100M	$100M ≤ Assets < $500M	$500M ≤ Assets < $1B	$1B ≤ Assets < $10B	Assets ≥ $10B	Total
Panel A. Commercial Banks and Thrifts Combined						
5-Year Average Quarterly Change	–50.55	7.85	5.15	2.50	1.00	–34.05
2003	3,683	3,172	481	411	95	7,842
2008	2,672	3,329	584	461	115	7,161
2013	1,661	3,486	687	511	135	6,480
Panel B. Commercial Bank Organizations Only						
5-Year Average Quarterly Change	–43.40	13.50	3.90	2.70	0.60	–22.70
2003	3,219	2,568	335	290	71	6,483
2008	2,351	2,838	413	344	83	6,029
2013	1,483	3,108	491	398	95	5,575

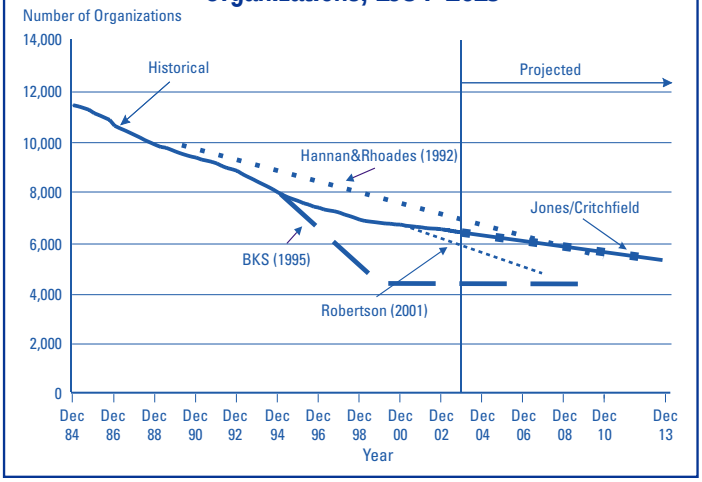
Note: Linear projections based on 5-Year average quarterly change (1999-2003)

2013. Our projections are based on the average quarterly net change over the five-year period 1999–2003. We chose to focus on only the last five years of data because we believe that the change occurring over this period better reflects the mix of forces affecting the banking industry at the turn of the millennium and that this period is therefore most relevant to anticipating the future direction of the industry's structure. To make our projections comparable with those of earlier studies, we projected both the number of commercial bank organizations and the number of commercial bank and thrift organizations combined. Table 1 presents our five- and ten-year projections. As can be seen in panel A, our linear extrapolations suggest a continuing decline (of 34 organizations per quarter) in the total number of banking and thrift organizations—from 7,842 at year-end 2003 to 7,161 at year-end 2008 and to 6,480 at the end of 2013. The projected decline over five years is 681 organizations (8.7 percent); over ten years, twice that. Projections for commercial bank organizations alone (panel B) show a similar pattern. Interestingly, projections for both groups indicate that the decline will occur exclusively within the smallest size group (organizations with less than $100 million in assets). Our extrapolations from the trends of the past five years indicate that all other size groups will grow by small amounts.

For comparison, figure 12 contrasts our linear projections for the number of commercial bank organizations with those from earlier studies. Remarkably, Hannan and Rhoades's (1992) "best-guess" 20-year projection for the number of commercial bank organizations in 2010 is not that much different from our own—their 5,500 compared

Figure 12

Comparison of Projections for the Commercial Bank Organizations, 1984–2013



with our 5,847. The projections by BKS (1995) and Robertson (2001), however, suggest significantly more of a decline among commercial bank organizations than is indicated by our linear extrapolation from the data for the last five years.

Beyond Linear Extrapolations

Although linear extrapolations like those described above provide a simple means of projecting industry structure, Shull and Hanweck (2001) have argued that projections based on simple linear extrapolations of past trends are inadequate because they fail to specify the process generating the structural change. We tend to agree. Although we used the linear approach for illustrative purposes, we believe this approach is somewhat naive because it fails to incorporate all the information contained in the data. Most importantly, it ignores the changing nature of the forces behind the decline in the number of organizations. Consequently, for reasons that will soon become clear, we view our linear projections as representing the lower bound of our estimates of the future size of the banking industry.

To improve on the simple linear extrapolations presented above, what is needed is a forecasting methodology that can capture the underlying features of the full time series on banking structure. An extremely general econometric model that promises to do this in a simple and expeditious manner is the autoregressive integrated moving average time-series model (ARIMA). First developed by Box and Jenkins (1976), this approach to modeling the processes that generate a time series of data has "withstood the test of time and experimentation as a reasonable approach for describing underlying processes that are probably, in truth, impenetrably complex."[32] In simple descriptive terms, this class of models either regresses a time series on its own past values or uses a moving average process to express a times series as a linear combination of past error terms, or does both. In practice, the Box-Jenkins approach to time-series model building has been made relatively easy through the use of modern statistical software programs. After testing various models for fit, we selected for our forecasting a first-order moving average model, fit to the second-differenced log of the time series.[33]

Figure 13 illustrates our forecasts of the total number of banking organizations for the years 2004–2013, based on the estimated parameters of our time-series model. As can be seen, we project the consolidation trend in the banking industry as continuing over the next ten years, albeit at a slightly slower pace over the second five-year period. In the near term (the next five years), according to our model, the industry will decline by a total of 552 organizations, from 7,842 at year-end 2003 to 7,290 by the end of 2008 (a decline of 7 percent). By 2013, our forecast shows the banking industry shrinking by an additional 424 organizations, to 6,866 (a 6 percent decline)—for a total reduction of almost a thousand organizations (or slightly more than 12 percent) over the ten-year period.

Although we believe that the forecast based on our moving average model is a substantive improvement over the forecast obtained through the simple linear extrapolation method, another interpretation of the data suggests that consolidation of the industry is slowing more appreciably than is suggested even by our time-series forecast. Indeed, according to an interpretation presented by Shull and Hanweck (2001), the decades-long consolidation trend in banking may come to an end in the not-too-distant future. Basically, Shull and Hanweck view the structural change in banking as a dynamic and nonlinear process in which a

[32] Greene (2000), 531.

[33] Given a time series, one can estimate several types of models within the class of ARIMA models. Model selection can then be based on the use of information criteria such as Akaike's information criterion (AIC) or Schwarz's Bayesian criterion (SBC), which seek to identify the "best" model–best in terms of accuracy and efficiency. We chose to use the SBC because of its greater emphasis on parsimony. Among the models tested, we settled on a first-order moving average model where the model was fit to the second-differenced log of the time series using maximum likelihood estimation (ARIMA [0,2,1]). Second-differencing was needed to achieve stationarity–an important underlying assumption of model estimation. To confirm stationarity, we examined the autocorrelation and partial correlation functions and conducted a Dickey-Fuller unit root test. See Box, Jenkins, and Reinsel (2000) or Judge et al. (1988) for a more detailed explanation of time-series model estimation and fit. Further details on model selection and testing are available from the authors of the present study.

population of banks in a stable state has been subjected to an exogenous shock (or shocks) that causes the population to shift to a new steady-state equilibrium. According to this interpretation, the reduction in the number of banking organizations is characterized as a situation in which an equilibrium banking structure (described by the stability in the number of banking organizations in the United States before 1980) was disturbed by economic, regulatory, and technological changes. The consequent decline reflected a transitional movement toward a new equilibrium structure.

Figure 13

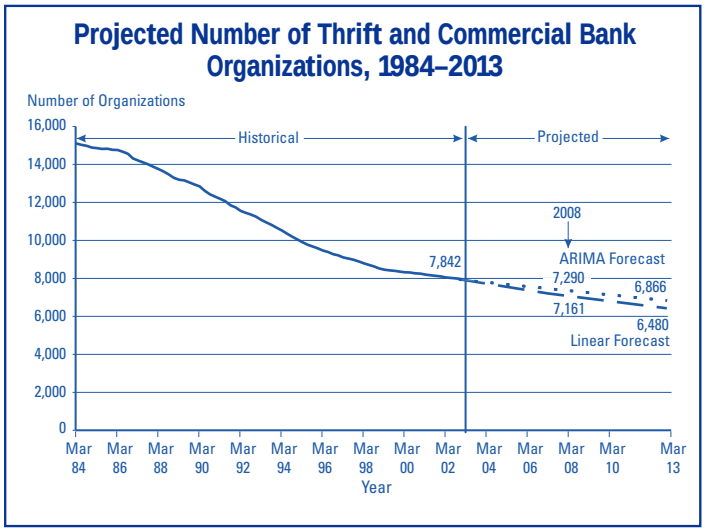


Figure 14

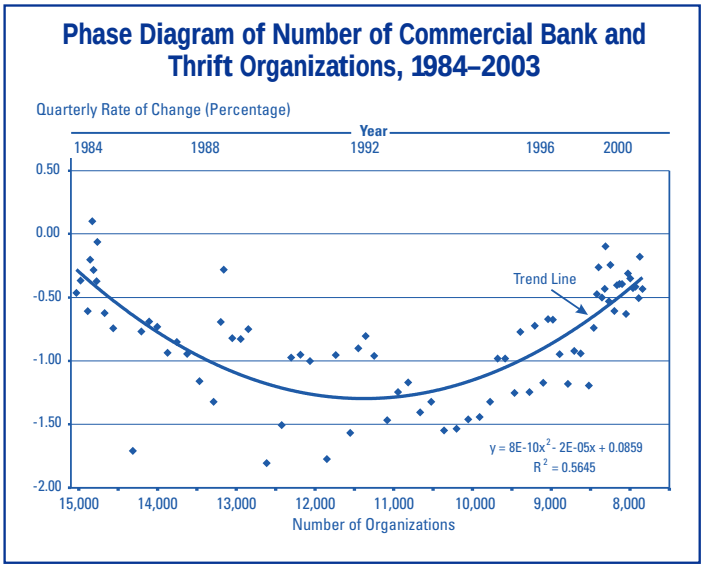


Figure 14 follows Shull and Hanweck in using a phase diagram. It plots the quarterly rate of change in the number of banking organizations against the actual number of organizations for the period 1984–2003. In the diagram we can observe a distinct transitional pattern (as indicated by the trend ine) from an equilibrium structure of just over 15,000 organizations (when the rate of change was last near zero) to the current structure of just under 8,000 organizations (at year-end 2003). Indeed, the transitional nature of the plot is quite dramatic. One noteworthy feature of the diagram is that once the numbers of banking organizations began to decline, they did so first at an increasing rate and then at a decreasing rate. The turning point appears to have been at about 11,500 organizations. This is roughly the size of the industry in mid-1992. Interestingly, that year marked both the end of a national recession and the unofficial end of the S&L and banking crises. And if we layer the phase diagram with a time line, it becomes easy to see how the transition has progressed since 1984.

Extension of the trend line to a point of intersection with the zero-rate-of-change line would indicate that the structure of the banking industry will again reach an equilibrium structure in about five years, at approximately 7,250 organizations (assuming that progression along the trend proceeds unimpeded). The conclusion to be drawn from the phase diagram—that the decline in the number of banking organizations has slowed appreciably and that industry structure is likely to stabilize within the next few years at about 7,250 organizations—is at least numerically consistent with the five-year forecast generated by our moving average model.

Conclusion

Considered together, our three forecasts (based on linear extrapolation, time-series modeling, and a phase diagram) imply that in the absence of a new shock to the industry, the U.S. banking industry is likely to retain a structure characterized by several thousand very small to medium-size community bank organizations, a less-numerous group of mid-size regional organizations, and a handful of extremely large multinational banking organizations. Consistent with projections from earlier studies, our projections indicate that the U.S. banking industry is not likely to resemble the banking industries in countries such as Germany, which have only a handful of universal banks.

Although our forecasts contrast rather sharply with conventional wisdom about the future pace of decline in the number of banking institutions, we believe these projections to be reasonable under current conditions. The major influences of the 1980s, under which the decline accelerated, are no longer relevant. Gone are the high failure rates and other contractionary influences of the thrift and banking crises. Similarly, the effects of the liberalization of interstate banking and branching laws are largely in the past, as are the effects of most other major deregulatory initiatives. Bank holding companies, for example, have already collapsed inefficient multistate, multibank structures, and opportunities for additional gains are limited. This might be especially true for the larger banks (which have been particularly active merger participants) as they become increasingly constrained by state and federal limits on deposit market shares. Also gone are the merger-accommodating atmosphere and the "irrational exuberance" that accompanied the amazing stock market boom of the late 1990s.

In their place is a more uncertain economic environment that has spawned fewer bank mergers and consolidations. Although we believe that sustained industry profitability and competitive pressures will lead to some additional decline in the number of banking organizations going forward, we do not foresee a return to the rate of decline witnessed in the late 1980s and early 1990s. Rather, we see a balance developing between the number of bank start-ups and the number of charter losses due to mergers and acquisitions—with little net change in the number of banking organizations nationwide. In other words, it just might be that the consolidation trend in banking—that "long, strange trip"—is nearing an end.

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Table A1

Share of Industry Assets and Deposits Held by the Nation's 25 Largest Banking Companies (Pro-forma) Data as of December 31, 2003

Ranking	Bank Holding Company	Total Assets[a] ($ Billions)	Share of Industry Assets	Cumulative Percentage of Assets	Domestic Deposits ($ Billions)	Share of Industry Domestic Deposits	Cumulative Percentage of Deposits
1	J.P. Morgan Chase & Co. / Bank One[b]	1,009	11.11	11.11	345	6.61	6.61
2	Bank of America / Fleetboston[b]	870	9.58	20.70	512	9.82	16.43
3	Citigroup Inc.	796	8.77	29.47	181	3.47	19.90
4	Wells Fargo & Company	380	4.19	33.65	241	4.62	24.52
5	Wachovia Corporation	362	3.99	37.65	213	4.09	28.61
6	Washington Mutual Inc.	276	3.04	40.68	168	3.23	31.84
7	U.S. Bancorp	192	2.12	42.80	114	2.19	34.03
8	National City Corporation	132	1.45	44.26	61	1.17	35.20
9	Suntrust Banks, Inc.	125	1.37	45.63	76	1.47	36.67
10	ABN AMRO Holding N.V.	107	1.18	46.81	46	0.88	37.55
11	HSBC Holdings PLC	98	1.08	47.88	45	0.86	38.41
12	Fifth Third Bancorp	95	1.05	48.93	51	0.97	39.38
13	BB&T Corporation	95	1.04	49.97	60	1.16	40.54
14	The Bank of New York Company, Inc.	90	0.99	50.97	34	0.65	41.19
15	Keycorp	85	0.93	51.90	48	0.92	42.11
16	State Street Corporation	80	0.89	52.79	13	0.25	42.36
17	Golden West Financial Corp.	80	0.89	53.67	45	0.87	43.23
18	The Royal Bank of Scotland Group PLC	78	0.86	54.53	58	1.12	44.34
19	The PNC Financial Services Group, Inc.	64	0.71	55.24	45	0.87	45.21
20	MBNA Corporation	59	0.64	55.89	31	0.59	45.80
21	COMERICA Incorporated	53	0.58	56.47	40	0.78	46.58
22	Southtrust Corporation	52	0.57	57.04	33	0.62	47.21
23	Allied Irish Banks, P.L.C.	50	0.55	57.59	31	0.59	47.80
24	Mitsubishi Tokyo Financial Group, Inc.	48	0.53	58.12	35	0.67	48.47
25	AMSOUTH Bancorporation	46	0.50	58.62	29	0.56	49.03
	Total Top 25 Banking Companies	**$5,321**	**58.62**		**$2,556**	**49.03**	

[a] Non-bank assets are excluded.

[b] Pro-forma data include two pending mergers: Bank of America and Fleetboston, J.P. Morgan Chase & Co. and Bank One Corp.

Source: FDIC Call Reports and Thrift Financial Reports

Table A2

Major Legislative and Regulatory Changes Affecting Banking Consolidation

Year	Description
1980	Depository Institutions Deregulation and Monetary Control Act (DIDMCA). Raised federal deposit insurance coverage limit from $40,000 to $100,000. Phased out interest-rate ceilings. Allowed depositories to offer negotiable order of withdrawal (NOW) accounts nationwide. Eliminated usury ceilings. Imposed uniform reserve requirements on all depository institutions and gave them access to Federal Reserve services.
1982	Garn-St Germain Act. Permitted money market deposit accounts. Permitted banks to purchase failing banks and thrifts across state lines. Expanded thrift lending powers.
1987	Competitive Equality in Banking Act (CEBA). Allocated $10.8 billion in additional funding to the Federal Savings and Loan Insurance Corporation (FSLIC). Authorized forbearance program for farm banks. Reaffirmed that the "full faith and credit" of the U.S. Department of the Treasury (Treasury) stood behind federal deposit insurance.
1987	Board of Governors of the Federal Reserve System (Federal Reserve) authorized limited underwriting activities for Bankers Trust, J.P. Morgan, and Citicorp with a 5 percent revenue limit on Section 20 ineligible securities activities.
1989	Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA). Provided $50 billion in taxpayer funds to resolve failed thrifts. Replaced Federal Home Loan Bank Board with the Office of Thrift Supervision to charter, regulate and supervise thrifts. Restructured federal deposit insurance for thrifts and raised premiums. Re-imposed restrictions on thrift lending activities. Directed the Treasury to study deposit insurance reform.
1989	Federal Reserve expanded Section 20 underwriting permissibility to corporate debt and equity securities, subject to revenue limit.
1989	Federal Reserve raised limit on revenue from Section 20 eligible securities activities from 5 percent to 10 percent.
1991	Federal Deposit Insurance Corporation Improvement Act (FDICIA). Directed the Federal Deposit Insurance Corporation (FDIC) to develop and implement risk-based deposit insurance pricing. Required "prompt corrective action" of poorly capitalized banks and thrifts and restricted "too big to fail." Directed the FDIC to resolve failed banks and thrifts in the least costly way to the deposit insurance funds.
1993	Court ruling in Independent Insurance Agents of America v. Ludwig allowed national banks to sell insurance from small towns.
1994	Riegle-Neal Interstate Banking and Branching Efficiency Act (Riegle-Neal). Permitted banks and bank holding companies (BHCs) to purchase banks or establish subsidiary banks in any state nationwide. Permitted national banks to open branches or convert subsidiary banks into branches across states lines.
1995	Court ruling in NationsBank v. Valic allowed banks to sell annuities.
1996	Court ruling in Barnett Bank v. Nelson overturned states' restrictions on bank insurance sales.
1996	Federal Reserve announced the elimination of many firewalls between bank and nonbank subsidiaries within BHCs.
1996	Federal Reserve raised limit on revenue from Section 20 eligible securities activities from 10 percent to 25 percent.
1997	Federal Reserve eliminated many of the remaining firewalls between bank and nonbank subsidiaries within BHCs.
1999	Gramm-Leach-Bliley Financial Modernization Act (GLB). Authorized financial holding companies (FHCs) to engage in a full range of financial services such as commercial banking, insurance, securities, and merchant banking. Gave the Federal Reserve, in consultation with the Treasury, discretion to authorize new financial activities for FHCs. Gave the Federal Reserve discretion to authorize complementary actives for FHCs. Established the Federal Reserve as the "umbrella" regulator of FHCs. Provided low-cost credit to community banks. Reformed the Community Reinvestment Act. Eliminated the ability of commercial firms to acquire or charter a single thrift in a unitary thrift holding company.
2001	Federal Reserve issued revisions to Regulation K. Expanded permissible activities abroad for U.S. banking organizations. Reduced regulatory burden for U.S. banks operating abroad and streamlined the application and notice process for foreign banks operating in the United States. Allowed banks to invest up to 20 percent of capital and surplus in Edge Corporations. Liberalized provisions regarding the qualification of foreign organizations for exemptions from the nonbanking prohibitions of Section 4 of the Bank Holding Company Act. Implemented provisions of Riegle-Neal that affect foreign banks.

Sources: Lown, Osler, Strahan, and Sufi (2000); Kroszner and Strahan (2000); and Montgomery (2003).

Table A3

Summary of Recent Empirical Studies on the Causes of Consolidation in the Banking Industry

Empirical Finding	Study Reference	Summary
Some evidence of increase in market power (share) with some evidence of price effects in concentrated market	Shull and Hanweck (2001); Berger, Demsetz, and Strahan (1999)	Surveyed the literature and found evidence of market power effects (with higher loan rates and lower deposit rates in concentrated markets) in the 1980s. Data for the 1990s, however, suggested a weaker relationship between local market concentration and deposit rates.
	Pilloff (1999)	Found that banks in more concentrated markets earned higher profits and that the number of multimarket contacts was positively related to profitability-suggesting that multimarket contact may reduce competition.
	Prager and Hannan (1998)	Found that a reduction in interest rates on local deposit accounts was associated with horizontal mergers that raised market concentration significantly.
	Simons and Stavins (1998)	Using data for the period 1986-1994, found that after a bank's participation in a merger, a 1.0 percent higher HHI was associated with a 1.2 percent reduction in interest rates on MMDA, a 0.3 percent lower rate on CDs, and lower rates on deposit accounts across the board.
	Moore and Siems (1998)	Found that the relationship between concentration and profitability was much weaker in 1997 than it had been a decade earlier.
	Berger and Hannan (1997)	Found that banks in more concentrated markets charged higher rates on small business loans and paid lower rates on retail deposits.
Some evidence of greater profit efficiencies	Berger (1998); Akhavein, Berger, and Humphrey (1997)	Found that mergers led to an improvement in profit efficiency. The improvement seemed to result from an increase in lending activity (as opposed to security investments) and a more efficient use of capital.
	Boyd and Graham (1998)	Found that being merged "helped" small banks-increasing ROA and decreasing expense measures.
Some evidence of improvements from geographic diversity	Group of Ten (2001)	Reviewed the latest research, which suggested that because of geographic diversification, consolidation of banks within the United States was likely to lead to reductions in risk. However, the studies also noted that these positive benefits might be offset by shifts to higher-risk portfolios or by operational risks.

Table A3 continued

Summary of Recent Empirical Studies on the Causes of Consolidation in the Banking Industry

Empirical Finding	Study Reference	Summary
Some evidence of improvements from geographic diversity	Berger and DeYoung (2001)	Found that the negative effects of distance tended to be modest in size. This finding suggests that efficient organizations can successfully export their superior skills, policies, and practices to their out-of-state affiliates.
	Hughes, Lang, Mester, and Moon (1996, 1999)	Found that when organizations diversified geographically, especially via interstate banking, efficiency tended to be higher and insolvency risk tended to be lower.
Some evidence of improvements in payment system efficiency	Hancock, Humphrey, and Wilcox (1999)	Found substantial scale economies in Fedwire operations and an improvement in cost efficiency of Fedwire from consolidation of processing sites. Suggested results were likely to carry over to consolidation of private sector processors.
	Adams, Bauer, and Sickles (2002)	Found indications of significant and positive scale economies in the provision of electronic payment processing services by the Federal Reserve (Fedwire, ACH, and Book-Entry securities). Results also showed that during the 1990s, technological change lowered marginal costs significantly.
Some evidence that management may act in self-interest	Hughes, Lang, Mester, Moon, and Pagano (2003)	Found evidence that managerial entrenchment at U.S. bank holding companies was associated with asset sales that yielded smaller improvements and with acquisitions that resulted in worse performance. Suggested that these results were consistent with empire-building strategies that sacrificed value.
	Bliss and Rosen (2001); Gorton and Rosen (1995)	Argued that two primary motives for bank mergers were empire building and increased managerial compensation, especially on the part of managers who were entrenched or insulated from the market.
	Hadlock, Houston, and Ryngaert (1999)	Found that banks with higher levels of management ownership were less likely to be acquired; argued that this evidence was consistent with an entrenchment hypothesis, which holds that management teams with significant ownership positions block attempts to be acquired at reasonable prices.

Table A3 continued

Summary of Recent Empirical Studies on the Causes of Consolidation in the Banking Industry

Empirical Finding	Study Reference	Summary
Some support for the too-big-to-fail motive	Shull and Hanweck (2001)	Found that the top 10 largest banks paid less for funds than smaller banks and operated with lower capitalization rates.
	Penas and Unal (2004)	Showed that positive bond returns and a decline in credit spreads were related to the incremental size attained in bank mergers by medium-sized banks-those most likely to become large enough to be considered TBTF.
	Kane (2000)	Showed that in banking megamergers of 1991-98, stockholders of large-bank acquirers gained value when a target institution was large. Argued that the effect of size underscored the possibility that too-big-to-discipline subsidies had distorted deal-making incentives for megabanks.
Some potential for increased systemic risk and safety net expansion	De Nicola and Kwast (2002)	Showed that, among large complex banking organizations during the 1990s, there was a significant upward trend in the degree of interdependency.
	Group of Ten (2001)	Concluded that there were reasons to believe that financial consolidation in the United States had increased the risk that the failure of a large complex banking organization would be disorderly.
	Saunders and Wilson (1999)	Found a dramatic reduction in bank capital ratios associated with increased safety-net support; also found that the structure and strength of safety-net guarantees might affect risk taking.

Table A3 continued

Summary of Recent Empirical Studies on the Causes of Consolidation in the Banking Industry

Empirical Finding	Study Reference	Summary
BUT Mixed evidence on cost efficiencies from scale economies	Stiroh (2000)	Examined the improved performance of U.S. BHCs from 1991 to 1997 and found that the gains were due primarily to productivity growth and changes in scale economies. Estimated cost functions showed modest economies of scale present throughout the period, with the largest BHCs showing stronger economies of scale.
	Hughes, Mester, and Moon (2001); Hughes, Lang, Mester, and Moon (1999); Hughes and Mester (1998)	Claimed to have found evidence of large-scale economies once risk diversification, capital structure, and endogenous risk taking were explicitly considered in the analyses of production.
	Berger, Demsetz, and Strahan (1999)	Extensively reviewed the literature on cost efficiency and found-on the basis of data from the 1980s and early 1990s-little efficiency improvement from mergers and acquisitions. However, cost efficiency effects might depend on the type of merger, the motivations of the managers, and the implementation of the merger.
	Kwan and Wilcox (1999)	Found significant (but still relatively small) expense savings in mergers that occurred in the mid-1990s, after the pure accounting effects on reported expense data were removed.
	Boyd and Graham (1998)	Examined the effects of mergers and found evidence of cost efficiency gains for only the smallest banks. The gains disappeared quickly with increases in size and were negative for larger banks.
	Peristiani (1997)	Found that acquiring banks in the 1980s achieved moderate improvements in scale efficiency-attributable in part to the fact that the smaller target banks were on average less scale-efficient than their acquirers.
Mixed evidence on cost efficiencies from scope economies	Stiroh (2004)	Examined the link between the banking industry's growing reliance on noninterest income and the volatility of bank revenue and profits. Found almost no evidence that this shift offers large diversification benefits in the form of more stable profits or revenue.
	Amel et al. (2002)	In reviewing the literature, found little evidence that mergers yielded significant economies of scope.

Table A3 continued

Summary of Recent Empirical Studies on the Causes of Consolidation in the Banking Industry

Empirical Finding	Study Reference	Summary
Mixed evidence on cost efficiencies from scope economies *(cont.)*	DeLong (2001)	Found that mergers that focused banks geographically and among product types created value, whereas those that diversified generally failed to benefit shareholders.
	Demsetz and Strahan (1997)	Showed that large bank-holding companies had better diversification across loan portfolios; it allowed them to operate with greater leverage and engage in more risky (and potentially more profitable) lending without increasing firm-specific risk.
	Kwan (1998)	Found that securities subsidiaries provided BHCs in the United States with potential benefits of diversification because revenues from the subsidiaries were not highly correlated with revenues from the rest of the BHC.
	Berger, Humphrey, and Pulley (1996)	Found no evidence of statistically significant revenue economies (and only small cost economies) of scope among either small or large banks over the period 1978-1990, even for the most efficient banks.
Little evidence of any significant, permanent increase in shareholder value	Calomiris and Karceski (1998); Pilloff and Santomero (1998)	Reviewed the literature and concluded that although some event studies found that acquirers increased their market value, most studies found that the market value of the acquiring bank declined whereas that of the target bank increased.
	Houston, James, and Ryngaert (2001)	Found (like previous studies) that the market value of the acquiring bank declined, on average, whereas that of the target bank increased. However, compared with the 1980s, the 1990s were a period of higher average abnormal returns for both bidders and targets. Results also suggested that the realization of anticipated cost savings was the primary source of gains in the majority of recent bank mergers.
	Cornett et al. (2003)	Found that diversifying bank acquisitions earn significantly negative announcement-period abnormal returns for bidder banks, whereas focusing acquisitions earn zero abnormal returns.

Table A3 continued

Summary of Recent Empirical Studies on the Causes of Consolidation in the Banking Industry

Empirical Finding	Study Reference	Summary
Little evidence of lower consumer prices	Shull and Hanweck (2001)	After reviewing prices for retail banking services over the last decade, found no evidence that retail prices had declined. In fact, the evidence suggested the opposite-that consumer prices had increased.
	Kahn, Pennachi, Sopranzetti (2000)	Found that mergers appeared to increase rates on unsecured personal loans charged by all banks in the market in which the merger had taken place. This was consistent with an increase in market power in the market for personal loans. However, the opposite effect was observed for rates on automobile loans.
	Prager and Hannan (1998)	Found a reduction in deposit rates attributable to substantial horizontal mergers (mergers between banks competing in the same geographic markets).
Little effect on the availability of services to consumers	Avery et al. (1999)	Found that mergers of banks with branches in the same zip code reduced the number of branches per capita, whereas other mergers had little effect on branch office availability.
	DeYoung et al. (1998)	Found that small business lending declined as banks aged and increased in size. But an increase in market concentration was found to have a positive effect on small business lending in urban markets and only a modest negative effect in rural markets.
	Jayaratne and Wolken (1999)	Found (using survey data on small business borrowers) that the probability that a small firm would have a line of credit from a bank did not decrease in the long run when there were fewer small banks in the area.
	Peek and Rosengren (1996, 1998); Strahan and Weston (1996, 1998); Berger, Kashyap, and Scalise (1995)	Found that large banking organizations generally devoted smaller proportions of their assets to small business loans and that mergers between large and small banks resulted in a decrease in small business lending. Mergers between smaller banks, however, did not appear to reduce small business lending.
	Cole, Goldberg, and White (2004)	Found that large banks tended to base their small business loan decisions more on financial ratios than on prior lender-borrower relationships. In contrast, small banks relied to a greater extent on the character of the borrower.