



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**RECENT CHANGES IN THE STRUCTURE OF THE BANKING INDUSTRY: CAUSES,  
EFFECTS, AND TOPICS FOR RESEARCH**

**SERGIO LENCE**

**Proceedings of a Seminar sponsored by  
North Central Regional Project NC-207  
“Regulatory, Efficiency and Management Issues Affecting Rural Financial Markets”  
New York, NY  
September 8-9, 1996**

Department of Agricultural and Consumer Economics  
College of Agricultural, Consumer and Environmental Sciences  
332 Mumford Hall  
Urbana, IL 61801

June 1997

*Copyright 1996 by author. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.*

## **Recent Changes In The Structure Of The Banking Industry: Causes, Effects, And Topics For Research**

Sergio H. Lence<sup>1</sup>

Major changes have occurred in the financial sector of the U.S. over the last couple of decades. Among many others, such changes have included a sweeping deregulation trend at both state and federal levels, the wide use of new financial instruments, the advent of institutional investors, the globalization of financial markets, the increased usage of securitization, and the extraordinary advances in the use of new communication and information technologies. Not surprisingly, the U.S. banking industry has also undergone major changes in structure.

Given the key role played by banking for the financial sector and the whole economy in general, it seems of great relevance to have a deeper knowledge of the structural changes that occurred in the banking industry in recent years. Hence, the purpose of the present study is to analyze thoroughly the structural changes that have characterized banking since 1980. More specifically, the objectives of the manuscript are fourfold. First, to describe the most important structural changes in banking. Second, to discuss and assess the possible explanations of such changes based on the recent empirical literature. Third, to examine recent empirical studies addressing the possible effects of the structural changes on the major financial market participants and on the overall economic activity. Finally, a research agenda regarding the causes and effects of the changes in banking structure is suggested, based on the perceived gaps in the existing body of empirical knowledge.

### **Major Structural Changes in Banking<sup>2</sup>**

To understand the changes occurred in the structure of banking and to avoid the ambiguities that plague much of the previous literature, it is imperative to define the following terms before proceeding any further:

1. **Bank:** A bank is an FDIC-insured commercial bank. Banks may be either affiliated with a bank holding company (BHC) or unaffiliated (often called independent) banks.
2. **Bank holding company (BHC):** A BHC is any company that has control over a bank. BHCs may have control over only one bank (O-BHC), or over more than one bank (M-BHC).
3. **Banking organization:** The term banking organization refers to both BHCs and unaffiliated banks.
4. **Bank branch:** A bank branch is any office of a bank, other than the head office, at which deposits are received, checks are paid, or money lent.
5. **Bank office:** The term bank office denotes either a bank or a bank branch.
6. **Merger:** combination of two banks not belonging to the same organization by which one of the bank charters disappears.

---

<sup>1</sup> Sergio Lence is an assistant professor, Department of Economics, Iowa State University.

<sup>2</sup> The basic sources of data for this section are Rhoades (1996), Amel, and Nolle.

Consolidation has been the most conspicuous structural change in banking. Consolidation is defined here as a decrease in the number of firms in the industry, along with a simultaneous increase in the average size of the continuing firms. Figure 1 depicts the number of U.S. banks and banking organizations in each year from 1980 through 1994. The number of banks fell by 3,909 units, from 14,222 in 1980 to 10,313 in 1994. Similarly, the number of banking organizations dropped by about 35% over the same period, from 12,239 in 1980 to 7,906 in 1994.<sup>3</sup>

Simultaneous with the reduction in the number of banks and banking organizations there was a substantial increase in the total amount of assets held by the banking industry. The value of the assets held by banks grew in nominal as well as in real terms. As depicted in Figure 2, the value of assets held by the banking industry increased in nominal (real) terms by 130% (28%) from 1980 through 1994. Given the increase in the value of assets and the reduction in the number of banks, the average bank size increased in current (constant 1987) dollars from 165 (120) million per bank in 1980 to 291 (380) million per bank in 1994. Clearly, the U.S. banking sector experienced a massive and steady consolidation since 1980.

Figure 3 provides information about the changes in the number of banks categorized by bank size, measured in value of assets in constant dollars of 1987. This graph reveals that the reduction in the number of banks by 3,559 units from 1980 through 1993 can be explained entirely by the decrease in the number of small banks. The number of banks with less than \$100 million in assets fell by 3,671 units from 1980 through 1993. Over the same period, the number of banks with assets between \$100 million and \$1 billion stayed almost unchanged, whereas the number of banks with assets between \$1 billion and \$10 billion increased by 25%, and the number of banks with assets over \$10 billion almost doubled.

Changes in the number of banks are approximately the balance of the increases due to new charters and the reductions caused by failures and by mergers.<sup>4</sup> The magnitude of the underlying forces behind the consolidation trend can be appreciated in Figure 4. Clearly, the decrease in the number of banks has been driven by mergers, as opposed to failures. From 1980 through 1994, 6,347 banks disappeared as a result of mergers, more than four times the 1,447 units that ceased to exist due to failures. Over the same period, 3,137 new charters were issued. Hence, had it not been for mergers, the number of banks would have actually increased by 1,690 units from 1980 through 1994.

Although as noted earlier the number of banking organizations declined steeply (Figure 1), the fate of different types of banking organizations diverged significantly over the period under analysis. Figure 5 shows that the reduction in the number of banking organizations resulted from the disappearance of independent banks. From 1980 through 1993, the number of

<sup>3</sup> Note that the number of banks cannot be smaller than the number of banking organizations, because all of the banks affiliated with a M-BHC show up as a single banking organization.

<sup>4</sup> New charters minus failures and acquisitions are not exactly equal to the change in banks or bank organizations. For example, turning the banks belonging to a M-BHC into branches reduces the number of banks, but such a change is not accounted for in Figure 4 (Rhoades 1996, footnote 26).

independent banks dropped by 69% from 9,482 units to 2,920 units, whereas BHCs grew by 89% from 2,886 units to 5,455 units. In 1980, independent banks were the most popular type of banking organization, but BHCs became the most popular type of banking organization in 1984, and by 1993 there were almost two BHCs per independent bank. It is clear from Figure 5 that the number of independent banks decreased, albeit at a decreasing rate, over the whole period. In contrast, the number of BHCs increased until 1985, and declined slightly afterwards. Figure 6 reveals that most BHCs are O-BHCs, as opposed to M-BHCs. The two types of BHCs experienced similar trends over the period under analysis.

In addition to the general consolidation trend, some of the largest mergers and acquisitions in history occurred over 1980-1994. The eight largest mergers of banking organizations occurred in this period. Also, there were over 140 mergers in which both the acquiring firm and the target bank had more than \$1 billion in assets. However, most of the acquisitions involved small target banking organizations. About 30% (75%) of the acquired banking organizations had assets of \$25 (\$100) million or less. Acquiring banking organizations tended to be large, with approximately 48% (26%) of the acquisitions made by banking organizations with more than \$1 (\$5) billion in assets, and only 24% of the acquisitions made by banking organizations with assets of \$100 million or less.

Not surprisingly, the occurrence of some of the largest mergers and acquisitions in history led to an increase in banking concentration at the national level. Figure 7 illustrates the proportion of deposits held by the largest U.S. banking organizations. From 1980 through 1994, the share of deposits held by the 10 and the 200 largest banking organizations increased from 19% to 27% and from 57% to 73%, respectively.

M-BHCs were the type of banking organization that made most of the acquisitions throughout the period under consideration. In 62% of the mergers, a M-BHC was the acquiring banking organization. O-BHCs were the second most popular type of acquiring banking organization (27% of the mergers). Independent banks were the acquiring banking organization in only 10% of the mergers.

Over the period 1980 through 1994, observed mergers split almost evenly between horizontal mergers (i.e., mergers in which both acquiring and acquired firms operated in the same market) and market-extension mergers (i.e., mergers in which acquiring firms operated in a different market than the acquired firm). The data also reveals that the acquired firm was in a metropolitan statistical area (MSA) in about 59% of the mergers, and in a non-MSA in the remainder 41% of the mergers. In other words, most acquisitions targeted urban banks rather than rural banks.

The aforementioned consolidation in banking has captured most of the attention from the public, possibly because of concerns about the potential for large banks to exercise market power in financial markets. Interestingly, however, simultaneous with consolidation there has also been a substantial increase in the number of bank branches and offices. The extent of the growth in branches and offices can be appreciated by observation of Figure 8. From 1980 through 1992, the number of branches and offices increased steadily by a total of 44% and 24%, respectively.

Their numbers seem to have leveled off after 1992. More impressive yet is the jump in the number of ATMs, that went from 18,500 units in 1980 to 109,080 units in 1994.

As mentioned earlier, about half of the mergers were horizontal mergers, which should have increased local market concentration. In contrast, increased branching should have reduced local market concentration. The data suggest that those forces tended to neutralize each other because local market concentration stayed virtually unchanged through the whole period. Figure 9 shows that the proportion of deposits held by the three largest banking organizations in metropolitan statistical area (MSA) and non-MSA counties remained almost constant at around 90% and 68%, respectively. A similar pattern is obtained when using the Herfindahl-Hirschman Index to calculate concentration in local banking markets (Figure 10). It is worth stressing the large differences in concentration trends experienced at the national level (Figure 7) as opposed to the local market level (Figures 9 and 10).

To summarize this section, the major structural changes undergone by the banking industry since 1980 are the following:

1. Steady consolidation, due to fewer banks and to a greater value of total assets held by the industry.
2. Reduction in the total number of banks, caused by a decrease in the number of small banks. The number of medium-sized banks increased slightly, and the number of large and very large banks increased substantially in relative terms.
3. Mergers, as opposed to failures, accounted for most of the reduction in the number of banks.
4. Most mergers involved the acquisition of small banks by larger banking organizations. However, many of the largest mergers in history also occurred over this period.
5. The reduction in the number of banking organizations can be attributed mostly to the disappearance of independent banks, as the number of BHCs actually increased.
6. The increase in the number of BHCs was mostly due to the increase in O-BHCs.
7. Large increase in the number of branches and offices, and in the number of ATMs.
8. Greater concentration at the national level, but not at the local market level.

### **Causes of Recent Trends in the Banking Industry**

The figures presented in the preceding section reflect a massive restructuring of the banking industry. However, they may be considered only symptoms of more fundamental changes affecting the economic environment faced by financial intermediaries. Interestingly, numerous economic and political events have occurred over the last two decades that could have precipitated or at least partly helped such trends in the banking industry. One such event is the advent of new information and communication technologies, which some researchers believe reduced the competitive advantage of small institutions in lending, an information-intensive activity. Financial deregulation and innovation are also cited by many as a cause of bank consolidation, because competition from bank as well as non-bank financial intermediaries could

have forced the least competitive banks out of business.<sup>5</sup> Other possible causes for the structural changes in banking are the crises suffered by several sectors of the economy (e.g., agriculture, real estate, oil). Many other economic events might also be mentioned that could explain the changes in banking structure observed since 1980.

Given the various possible explanations for the structural changes in banking, it seems important to explore them in detail in order to uncover the one/s that most likely could have driven the observed trends. This exercise should help the public and policy makers understand the economic forces behind the restructuring of the banking industry. Such an understanding is of great relevance for at least two reasons.

First, knowing the causes of the changes in bank structure would be useful to infer their likely implications, not only for banks and other financial intermediaries, but also for other economic sectors related to them. For example, if consolidation has been driven mostly by efficiency considerations, one should expect depositors and borrowers to benefit from the observed changes in bank structure. In contrast, consolidation would be detrimental to depositors and borrowers if the major force behind it was the achievement of market power. Therefore, the exercise should prove rich in implications for policy making.

Second, understanding the reasons for the changes in bank structure observed since 1980 can provide some insights about the future. For example, if most changes in structure were driven by one-time events like the crises in agriculture and in other sectors of the economy (e.g., oil, real estate), they would be more likely to be reversed than if the changes were mostly due to changes in technology. Again, the exercise should yield numerous policy implications.

For didactic purposes and analytical tractability, the possible explanations that have been advanced to explain the trends in the banking industry are analyzed next following the classification reported in Table 1. In Table 1, causes for the recent banking trends are classified as those driven by economic forces and those motivated by government action. This major division is adopted here to highlight the different role played by economics and policy in shaping the structure of the banking industry.

## **1. Economic Forces**

A reasonable hypothesis is that at least some of the structural changes observed in the banking industry are due to the selfish pursuit of economic gains by some of the interest groups involved in banking. For example, such gains might take the form of higher profits, of job security, or of higher wages. For our purposes, we classify such pursuit of gains as "economic forces" if there is no apparent involvement by the government in driving or in shaping them, and as "government action" otherwise.

---

<sup>5</sup> Elimination of interest rate ceilings on bank deposits, relaxation of intrastate branching restrictions and interstate banking constraints are examples of deregulations that could have increased competition among banks. Mutual funds and securitization are examples of competitive pressures exerted by non-bank financial institutions.

*1.1. Economic forces driven by banks' stockholders:* Here, economic forces are subdivided between those arising from the interests of banks' stockholders and those arising from the interests of banks' managers. This subdivision reflects the fact that "banks" are not monolithic institutions, but are made up of two basic constituencies (stockholders and managers) with potentially conflicting interests. For example, stockholders are most likely to be interested in profitability and efficiency, whereas managers are most likely to be concerned about job security and compensation. Clearly, which interest group (if any) is behind the changes in bank structure has important policy implications.

Probably the most appealing hypothesis for the observed trends in the banking industry is that they are the result of the actions by banks' stockholders to maximize returns on their equity.

Examples of such

Table 1: Possible causes of recent structural changes in the banking industry.

- 
1. Economic forces
    - 1.1. Driven by banks' stockholders
      - 1.1.1. Cost reduction
      - 1.1.2. Closing of unprofitable operations due to overcapacity in a "declining" industry
      - 1.1.3. Increased revenues
      - 1.1.4. Market power
      - 1.1.5. Portfolio diversification
    - 1.2. Driven by banks' managers
      - 1.2.1. Portfolio diversification
      - 1.2.2. Managerial compensation
      - 1.2.3. Lower probability of hostile takeovers
      - 1.2.4. Higher probability of friendly takeovers
  2. Government action
    - 2.1. Lending restrictions
    - 2.2. Risk-related pricing of deposit insurance
    - 2.3. "Too big to fail" doctrine
    - 2.4. Implicit protection from hostile takeovers
    - 2.5. Relaxation of branching and interstate banking
    - 2.6. Regulatory compliance
    - 2.7. Tax issues
- 

actions include reducing the costs of operation, searching for higher revenues, or exercising market power to extract monopolistic rents. The empirical evidence on the stockholders' hypothesis is examined next.



In order to maximize profits, firms must first produce the desired level of output at the lowest possible cost. Because of the observed consolidation in banking, numerous studies have tried to find out whether the merger wave was due to the pursuit of lower average costs stemming from higher production efficiency. Merger activity may increase production efficiency in at least three different ways, namely, by reducing X-inefficiency, by attaining economies of size, and by achieving economies of scope. It is said that firms are X-inefficient when they deviate from the production-efficient frontier which depicts the maximum attainable output for a given level of inputs. Merger activity may be induced by the goal of increasing efficiency if efficient banking organizations acquire X-inefficient firms with the purpose of turning them into efficient operations. There are economies of scale when firms are able to produce at a lower cost per unit of output by increasing the size of operation. If economies of scale do exist in banking, the merger of two banking organizations would allow the resulting firm to produce the same amount of output at a lower cost than either of the merging firms operating separately. Finally, economies of scope exist when the total cost of producing several outputs jointly is smaller than the total cost of producing the same outputs separately. If there are economies of scope in banking, mergers might have been driven by the goal of joining the operations of banking organizations with different types of products, so that the resulting banking organization would end up producing the same arrange of products but at lower cost.

For the banking industry, empirical research suggests that X-inefficiencies are relatively large and that they are more important than economies of scale and scope (Berger and Humphrey; Berger, Hunter, and Timme; Humphrey). Similar findings were obtained by Neff et al. and by Featherstone and Moss using data for agricultural banks only. Kwan and Eisenbeis showed that, after controlling for scale differences, small banking organizations are more X-inefficient than large banking organizations, and that firm-specific X-inefficiencies are significantly correlated with individual stock returns for smaller banking organizations. These findings are consistent with the typical type of merger observed since 1980, which involved small banking organizations being acquired by larger banking organizations. Additional evidence is provided by DeYoung and Whalen, who report that in a study of mergers of unrelated banking organizations, the acquiring firm was usually more X-efficient than the target firm.

The existence of economies of scale and scope is one of the most researched issues in banking. Summaries of such studies have been conducted by Gilbert; Mester; Clark; and Berger, Hunter, and Timme. There is a consensus that there exist economies of scale, but that they are exhausted at a relatively small size of banking organization (i.e., with assets somewhere between \$75 million and \$300 million). There is also a consensus that there are small but significant diseconomies of scale at the largest banking organizations (Berger and Humphrey, Humphrey). Complementing this work, Shaffer (1989) showed that banking organizations with less than \$50 million in assets had much worse performance during the 1980s than medium-sized bank organizations. In addition, Samolyk (1994b) found that, after controlling for state effects, local conditions, and nationwide trends, the best-performing banking organizations in the 1980s were relatively small (i.e., with assets between \$100 million and \$1 billion in 1987 dollars), and that the largest banking organizations did worse than their smaller counterparts. Therefore, the empirical literature supports the hypothesis that most of the observed mergers (i.e., those in which small banking organizations were acquired by a larger banking organization) could have

been driven by the achievement of economies of scale. Similarly, the increase in the average size of banking organizations that occurred since 1980 may be explained by pursuit of economies of scale. However, the empirical findings cannot rationalize economies of scale as a triggering factor for the mega-mergers (i.e., those involving the largest banking organizations) so common since 1980, or for the formation of the largest banking organizations in history.

Both the large increase in the number of branches and the advent of the O-BHC as the most popular type of banking organization suggest that multibranch O-BHCs may provide efficiency advantages over either independent banks or M-BHCs. Indeed, the available empirical literature tends to support this hypothesis. The study by Grabowski, Rangan, and Rezvanian provides evidence that multibranch O-BHCs are a more efficient organizational form than M-BHCs. Linder and Crane found that the conversion of bank affiliates to branches yield better post-merger performance than the acquisition of banks by M-BHCs. Using event study techniques, DeYoung and Whalen found significantly positive abnormal returns to the first announcement by a M-BHC of its intention to transform itself into a multibranch O-BHC. Newman and Shrieves examined the operating efficiency of different types of organizational forms. According to their study, O-BHCs exhibited significantly better mean efficiency than independent banks, whereas the mean efficiency of M-BHCs was not significantly better than that of independent banks.

A commonly accepted view is that banking is an industry in decline because it faces numerous nonbank competitors (e.g., mutual funds, finance companies) that can offer banking products more efficiently, either because nonbanks are much less regulated or because technological advances now enable nonbanks to compete more aggressively (e.g., McColl, Federal Reserve Bank of Chicago). Under this view, the consolidation trend simply reflects the fact that most inefficient firms in an industry with overcapacity will be driven out of business.

There are several studies that provide strong evidence challenging the view that banking is a declining industry (e.g., Kaufman and Mote, Boyd and Gertler (1994b), Remolona and Wulfekuhler, Wheelock). Also, if banking were an industry in decline, no new bank charters would have been issued, and the reduction in the number of firms should have been due to failure rather than to mergers. But such implications are at odds with the data reported in Figure 4. On the other hand, DeYoung and Whalen found that failed banks were significantly less efficient than their peers 5 to 6 years before failure. Given the existing evidence, it may be concluded that it is unclear whether banking is in decline and characterized by overcapacity. However, firms that have been driven out of the banking business seem to have been the most inefficient ones.

Some studies have suggested that increased revenues might explain the popular trend of banking organizations merging and transforming bank offices into branches (e.g., Calem 1993). This is true because customers can deposit funds into their accounts at any branch of a bank, but cannot do so at different banks or at any affiliate bank of a M-BHC. Also, branching might benefit businesses that require banking in different locations by simplifying their cash management. If such benefits are large enough to induce customers to switch banking organizations, the latter would have strong incentives to merge and convert affiliates into branches even if there are no gains in efficiency from doing so. This assertion is true because

banking organizations would be able to increase revenues as a result of the larger expected number of customers served after merging and branching. Unfortunately, to date this issue has not been analyzed empirically.

A popular view contends that the consolidation trend in the banking industry has been motivated by the prospect of exercising market power to extract monopolistic rents. Given the important policy implications of this hypothesis, it is not surprising that many studies have attempted to test it. In a recent review of such studies, Shaffer (1994) concluded that empirical studies employing the structure-conduct-performance paradigm provide mixed results regarding the extent of market power in banking. According to Shaffer, the most sophisticated of the structure-conduct-performance studies reveal little connection between concentration and monopoly power, and none of such studies should be regarded as definitive. Shaffer also concluded that most empirical studies employing the "new industrial organization" paradigm support the hypothesis that banking is a competitive industry, even though (i) the techniques used are biased against such hypothesis and (ii) some of the markets examined are highly concentrated. These findings imply that banking markets may perform competitively even in the presence of relatively high concentration. However, Hannan and Liang found that local market power may exist in some product lines (e.g., money market deposit accounts).

A special case of the market power hypothesis is the "conglomerate" power hypothesis, which asserts that large banking organizations may be able to cross-subsidize markets in order to drive smaller competitors out of business and extract monopolistic profits in the long run. Empirical studies yield little evidence in favor of the conglomerate power hypothesis (Rose and Wolken, Curry and Rose 1983, Curry and Rose 1984, Hanweck and Rhoades).

Given the aforementioned findings from the empirical literature, it seems safe to conclude that the available evidence provides no clear support for the hypothesis that the concentration trend has been driven by the search for market power. Supporting this conclusion is also the fact that at the local market level, which is the relevant market for most of the services provided by the banking industry, concentration stayed virtually unchanged since 1980 (Figure 9).

Portfolio diversification is another hypothesis often advanced to explain both merger and branching activities. Portfolio diversification is beneficial to shareholders if at least one of the following conditions is met (Martin, Cox, and MacMinn, Chapter 12): (i) bankruptcy is costly, (ii) equity transactions are costly, and (iii) taxes may be arbitrated. This hypothesis is consistent with market-extension mergers because of the possibility to diversify risks geographically. This assertion is true because the need for banks to monitor borrowers implies that a bank's location may be a crucial determinant of its choice of borrowers (Black). Portfolio diversification may also be consistent with horizontal mergers, if the merging firms originally targeted different types of borrowers or offered different lines of products.

The studies that examined empirically the hypothesis of geographic portfolio diversification have found supporting evidence for it. Gilbert and Belongia found that agricultural banks affiliated with large BHCs have lower agricultural loan ratios than other banks in the same counties. According to the authors, BHC affiliates have lower agricultural loan ratios

because such banks are better able to diversify their loan portfolios away from agriculture. Laderman, Schmidt, and Zimmerman showed that, *ceteris paribus*, rural banks devote a significantly larger proportion of their loan portfolios to agricultural loans than do urban banks. Furthermore, rural (urban) banks hold a larger share of nonagricultural (agricultural) loans when statewide branching is permitted than when branching is restricted. Smith found that branching allowed banks to take advantage of diversification and let them lend to agriculture without increasing the likelihood of closure. Liang and Rhoades found that intrastate geographic diversification reduced banking organizations' financial risk. Benston, Hunter, and Wall's econometric analysis of price bids to acquire target banks revealed that would-be acquiring organizations bid more for merger partners with the potential for earnings diversification.

Given the empirical evidence available, it may be concluded that the branching and market-extension merger trends may have at least partly been driven by the search for geographic diversification. Unfortunately, no empirical study has examined whether other types of portfolio diversification (e.g., product-line diversification) might explain the horizontal mergers or even some of the market-extension mergers. However, Pederson demonstrated that rural bank asset portfolios responded in a manner consistent with the predictions of a mean-variance portfolio model.

Unlike the literature that has been reviewed thus far, numerous studies have attempted more direct tests of the general hypothesis that recent trends, in particular mergers, have been driven by the interests of banks' stockholders. Rhoades (1994) provides an excellent summary of such studies for the period 1980-93. Of the 39 studies examined by Rhoades, about half used the "operating performance" (or "observed performance") approach, while the other half used the "event study" approach. Operating performance studies analyze changes in performance (e.g., profits) from before merger to after. In contrast, event studies look at stock returns of merging banks relative to returns on a portfolio of stocks representing the market. The relative performance of stock returns is studied over a period beginning sometime before the merger announcement and ending sometime after the announcement. By design, operating performance studies aim at yielding evidence on actual performance after mergers, whereas event studies focus on uncovering the financial market's expectation as to the overall performance results of mergers.

According to Rhoades, operating performance studies consistently find no improvements in cost efficiency or in profitability stemming from bank mergers. Also, such studies find no evidence that horizontal mergers have performance effects different from those of market-extension mergers. Furthermore, results are robust within studies, across studies, and over time. Event studies generally find that stockholders of target firms have gains, but provide inconsistent evidence regarding either returns to bidders or returns to bidders and targets combined. Overall, the results from the operating performance and event studies led Rhoades to conclude that there is little empirical support for the view that bank mergers result in improvements in performance.

To summarize, the empirical literature provides indirect evidence supporting the hypothesis that some of the recent banking trends could have been driven by the interests of banks' stockholders. Such evidence includes the findings that (i) there are substantial X-

inefficiencies in banking and the smallest banks are the most X-inefficient; (ii) acquiring banks tended to be more X-efficient than acquired banks; (iii) there are economies of scale and scope in banking; (iv) failed banks were the most inefficient ones; (v) multibranch O-BHCs are the most efficient organizational form; (vi) banks with more opportunities to diversify their portfolios tended to diversify more; and (vii) geographic portfolio diversification reduced the likelihood of bank failure. However, the direct evidence available on the most conspicuous trend (e.g., mergers) provides little support for the bank stockholder hypothesis. Furthermore, empirical findings cannot rationalize the consolidation trend as a result of the search for market power, or the mega-merger trend as having been driven by banks stockholders' interests.

*1.2. Economic forces driven by banks' managers:* For banking organizations that are not closely held, there is a potential for managers to pursue their own interests at the expense of the firm's stockholders interests. In particular, managers may search for higher salaries, perks, or job security. The following discussion focuses on the empirical evidence regarding the managers' hypothesis.

Managers may benefit from portfolio diversification because such strategy reduces the risk of bankruptcy. Therefore, *ceteris paribus*, portfolio diversification increases job security. As discussed earlier, there is empirical evidence that banking organizations tended to exploit opportunities to diversify geographically, and that diversification reduced the likelihood of bank failure. However, large banking organizations are the most diversified and are generally significantly more leveraged than small ones (e.g., Boyd and Graham, Boyd and Gertler 1994a). Other things equal, higher leverage increases the potential for higher profits but also increases the risk of bankruptcy. Although more evidence is needed before more definitive conclusions may be reached, the aforementioned findings suggest that banking organizations' greater portfolio diversification is accompanied by higher leverage. If this is indeed the case, portfolio diversification is likely to be more consistent with the pursuit of stockholder's interests than with accommodating managers' interests.

Another special case of the managers' hypothesis postulates that managers have incentives to increase the size of the banking organizations they manage, because by doing so they can justify bigger compensations (either as salaries or as perks). Boyd and Graham is the only study addressing this issue for the banking industry. Results from their study of the 50 largest BHCs support the managerial compensation hypothesis: compensation was found to be positively and significantly related to asset size, but not significantly related to either profitability or asset growth.

It has also been argued that managers may engage in "empire building" for job security reasons. According to this view, huge banking organizations are less likely to be the target of hostile takeovers. An alternative hypothesis posits that some mergers may have been motivated by managers' job security concerns, but by increasing the chances of becoming the target of friendly takeovers rather than by deterring hostile takeovers. There are no studies exploring either of these hypotheses. However, a stylized fact consistent with both arguments is that the vast majority of mergers in banking are friendly takeovers (Boyd and Graham).

The conflict of interest between managers and stockholders of banks has been explored empirically by Allen and Cebenoyan. They found that most acquisitions are made by banking organizations with entrenched managers (i.e., banking organizations in which a large proportion of equity is held by the management group, and the rest is fragmented among outside investors). In addition, Allen and Cebenoyan found that stock prices tend to respond negatively (positively) to acquisition announcements by banking organizations with entrenched (non entrenched) managers. These results support the hypothesis that management groups with enough control pursue actions inconsistent with stockholders' best interests.

In summary, the managers' hypothesis is theoretically appealing to explain the merging trend, and in particular to rationalize why mega-mergers occurred. Furthermore, the hypothesis tends to be supported by the findings of the few empirical studies that explored it. However, the validity of the managers' hypothesis should be viewed as undetermined until subjected to more extensive empirical research.

## **2. Government Action**

Some researchers contend that government action (or inaction) has played a key role in the recent trends characterizing the banking industry. For example, it has been pointed out that the relaxation of branching laws has encouraged the consolidation trend, or that the reluctance to let the biggest banks fail has encouraged the formation of mega banks. Although stockholders' interests or managers' interests are crucially involved in both examples, such hypotheses are classified here as "government action" rather than "economic forces" because they depend to a great extent on the action by government.

The major government actions and policies that might have helped or shaped some of the observed trends in the banking industry include (i) lending restrictions, (ii) risk-related pricing of deposit insurance, (iii) "too-big-to-fail" doctrine, (iv) implicit protection from hostile takeovers, (v) relaxation of branching and interstate banking restrictions, (vi) costs of regulatory compliance, and (vii) tax advantages. These government actions are the object of the following review.

Banks face various legal restrictions on their lending activities. The most important of such restrictions is the limit on the amount that may be lent to any single borrower. For national banks, this limit is 15% of the bank's unimpaired capital and surplus for loans that are not fully secured (Spong). Lending limits are likely to pose a handicap to certain types of banks (e.g., agricultural banks lending to large commercial farms). Although such banks might still be able to accommodate large loans to a single borrower by working with correspondent banks or by offering syndicated loans, they are likely to be less competitive than banks not facing lending limits. Therefore, it is reasonable to hypothesize that lending restrictions in the presence of increased needs for financial capital in some sectors of the economy (e.g., agriculture) might have driven the trend towards larger banks and/or banking organizations. Although intuitively appealing, this hypothesis has not been the object of empirical analysis.

All Federal Reserve member banks are required to insure their deposits with the Federal Deposit Insurance Corporation (FDIC). Due to the problems faced by the financial intermediation sector in the 1980s, Congress established higher deposit insurance premiums in 1989. Furthermore, the FDIC Improvement Act of 1991 required the FDIC to establish risk-based deposit insurance premiums (Spong). Before 1991, the premium paid by banks for such insurance was identical across institutions, regardless of their risk. Therefore, deposit insurance gave riskier banking organizations a relative advantage over their safer competitors. It may then be hypothesized that changes in deposit insurance premiums could have affected the structure of the banking industry. This assertion is true because some banking organizations might not be viable with either higher insurance premiums or without the competitive advantage provided by uniform deposit insurance premiums. As a result, nonviable banks might either disappear or be acquired by banking organizations with superior risk management. No study has tested this hypothesis empirically. However, it seems highly unlikely that the banking industry trends discussed previously could be related to changes in deposit insurance policies, because the latter changes are too recent relative to the former trends.

According to the "too-big-to-fail" doctrine, governments may not allow banking organizations to fail when such firms are so large that their failure may affect the economy as a whole. Boyd and Graham speculate that the "too-big-to-fail" doctrine provides incentives for the formation of mega-banks. Boyd and Graham (p. 12) assert:

"... if a bank gets big enough to be considered too big to fail, it gets implicit guarantees for all its liabilities, whether they are insured deposits or not. The bank does not have to pay for these guarantees, since deposit insurance premiums are only assessed against deposits. So, in essence, attaining a certain size provides a bank with some free insurance and more complete coverage than it would get otherwise."

Some evidence consistent with the "too-big-to-fail" hypothesis is provided by Boyd and Graham. They showed that, when measured as the percentage of same-size banks that required government assistance, the rate of failures among large banks was considerably greater than the rate of failure among small banks over the period 1971-88. Among other evidence of the "too-big-to-fail" hypothesis, Boyd and Gertler (1994a) showed that the largest banks were much more leveraged in the 1980s than might naturally be explained by scale economies. Also favorable to this hypothesis is the study by O'Hara and Shaw, who found that investors did respond to an official pronouncement of the "too-big-to-fail" doctrine. In contrast, after an extensive review of event studies, Rhoades (1994) found mixed evidence about the investors' expectations regarding the post-merging value of acquiring banking organizations. The findings by Benston, Hunter, and Wall are inconsistent with the hypothesis that would-be acquiring banking organizations would bid more for target banks that offered opportunities to increase risk and/or to become too big to fail. In addition, Kuester and O'Brien estimated the value of government insurance and found that it is not systematically related to bank size. In view of the mixed evidence, it may be concluded that more research is needed before settling the validity of the "too-big-to-fail" hypothesis to explain the mega-merger trend observed since 1980.

Boyd and Graham have argued that implicit regulatory protection from hostile takeovers might have contributed to the trend towards more mega-banks. If, as suggested by most of the empirical literature, the largest banking organizations have no competitive advantages and are likely to experience scale diseconomies, hostile takeovers might increase stockholders' value by buying large banking organizations, dividing them into smaller units, and ousting bad management. But hostile bank takeovers are very difficult to execute because they must be approved by regulators. Consequently, once a mega-bank is formed there are no mechanisms facilitating its split into smaller and potentially more efficient banking organizations. Unfortunately, the only evidence available regarding this hypothesis is the notorious lack of hostile takeovers in the banking industry. Empirical research is clearly needed to assess the validity of this theory in explaining the significant increase in the number of very large banking organizations.

The 1980s and early 1990s were characterized by a generalized relaxation of legal restrictions to interstate banking as well as to intrastate and interstate bank branching (Amel). Such liberalization of banking laws might have triggered the trends towards larger banking organizations, mergers, or branch proliferation. This hypothesis could be justified in numerous ways, e.g., banking restrictions might have previously prevented the achievement of economies of scale or scope, or of more diversified portfolios. Indirect evidence regarding this hypothesis is provided by much of the literature already reviewed (e.g., on cost reduction, increased revenues, and portfolio diversification). Direct evidence is provided by numerous empirical studies specifically addressing the impact of changes in state banking laws.

The hypothesis that liberalization of intrastate banking may have contributed to the branching trend is supported by Nolle's study. In particular, Nolle found that the relative number of BHCs choosing to operate as M-BHCs in a state which liberalized banking laws midway through 1980-93 first rose and then dropped off; but that the relative number of BHCs that opted to operate as M-BHCs in states with liberal (restrictive) branching laws declined (increased). The econometric analysis by Evanoff indicates that, *ceteris paribus*, the number of banking offices per square mile in states with liberal bank branching laws was 65% higher than in states with restrictive branching laws. Clair found evidence that intrastate branching liberalization reduced the number of banking organizations but increased the number of banking offices. According to Calem (1994), intrastate branching liberalization triggered consolidation of small banking organizations into larger organizations. The event studies by Laderman and Pozdena and by Goldberg, Hanweck, and Sugrue report that the stock prices of BHCs were significantly affected by changes in interstate banking laws. In addition, Adkisson and Fraser found that bank merger premiums are significantly larger in states that permit interstate banking and/or unlimited intrastate BHC acquisitions. In summary, the hypothesis that relaxation of state banking laws might have triggered the trends towards larger banking organizations, mergers, and branch proliferation is strongly supported by the existing empirical evidence.

It is often claimed that regulatory compliance yields multibranch O-BHCs more cost efficient than similar banking organizations operating as M-BHCs. This claim is based on the fact that, unlike M-BHCs, multibranch O-BHCs require the examination of only one bank and the filing of only one set of regulatory reports (Savage). There is no direct evidence available



regarding this hypothesis. The previously cited studies by Grabowski, Rangan, and Rezvanian; Linder and Crane; DeYoung and Whalen; and Newman and Shrieves report that multibranch O-BHCs are a more efficient organizational form than M-BHCs, but it is unclear whether such higher efficiency of multibranch O-BHCs stems from regulatory compliance costs or is due to other reasons.

Finally, it is possible that the specific form of some of the observed mergers or the choice of banking organization type (i.e., multibranch O-BHCs or M-BHCs) might have been driven in part by differential tax treatments. Although such a hypothesis seems appealing, to date it has not been tested empirically.

Upon review of the various government action hypotheses, it may be concluded that a priori most of them seem to provide plausible partial explanations for some of the trends observed in the banking industry. Furthermore, there are strong indications that changes in state banking laws did contribute to some of such trends. However, the empirical literature attempting to test the other government action hypotheses is virtually nonexistent. Therefore, until more empirical research is performed, government actions should be considered potential but largely untested partial explanations of the structural changes that have taken place in the banking industry.

### **Effects of the Recent Trends in the Banking Industry**

Banks are financial intermediaries. Their major economic function consists of matching the needs of the ultimate demanders for funds (i.e., borrowers) with the needs of the ultimate suppliers of financial capital (i.e., depositors). From this perspective, it is clear that changes in banking structure are likely to have a major impact not only in the financial intermediation sector, but also on both borrowers and depositors. Without further analysis, however, it is not possible to assess the likely impacts of banking structure changes on borrowers and depositors. In addition, changes in banking structure are likely to have effects on the overall economy beyond depositors and borrowers, because the latter are linked to other sectors of the economy not directly related to the financial intermediation sector.

Following the preceding discussion, in this section we review the literature concerned with the possible effects of the recent trends in banking. To help focus on the implications for policy making, the presentation is divided along the lines of the major constituency groups. That is, this section focuses on the effects of recent banking trends on financial intermediaries, borrowers, depositors, taxpayers, and the economy as a whole.

#### **1. Effects on Financial Intermediaries**

Several issues are of interest regarding the effect of recent trends on financial intermediaries. For example, a highly relevant question is whether the restructuring in banking spurs or hinders competition. In this regard, there is empirical evidence that neither merger nor branching hampers competition in financial markets. Upon examination of grandfathered interstate BHCs, Goldberg and Hanweck concluded that the ability to operate banks interstate

gave no long-run competitive edge to those BHCs with such a privilege. Lawrence and Klugman found no evidence that out-of-state banking organizations competed unfairly in rural markets. Calem and Nakamura found bank branching to be procompetitive because it tended to reduce price differential across localities. According to Rose and Wolken, affiliation with a geographically diversified BHC provided no significant long-term advantage for BHC subsidiaries over independent banks. Calem (1987, 1993) reviewed empirical evidence favoring the notion that mergers and branching enhance competition. Laderman and Pozdena examined the response of BHC stock returns to changes in interstate banking laws, and concluded that interstate banking increases potential and/or actual competition, in particular in markets previously restricted. Finally, Calem (1987, 1993) argued that bank regulators can block proposed mergers that might have anticompetitive effects, especially in local markets, and Holder (1993a, 1993b) showed that regulators have carefully considered competitive issues before approving bank mergers.

Another question that has preoccupied the public is whether the recent trends harbinger the disappearance of small community banks. Many consider small community banks as more beneficial to local economies. The aforementioned evidence of increased competition in banking markets coupled with the evidence that small banking organizations were less efficient indicate that the market share held by small banking organizations in the early 1980s was not sustainable in the long run. For example, Moore showed that relaxation of geographic banking restrictions did not cause small banking organizations to lose more market share than would be predicted on the basis of historical patterns. However, this observation does not imply that the only long-run sustainable number of small banking organizations is zero. According to Nakamura, small banks will continue to exist along with large banks because the former are better suited to lend to small borrowers because of informational advantages. Small banks can better assess creditworthiness of small businesses through their deposit accounts. Nakamura also presented empirical evidence consistent with the claim that the market for small business loans tends to be less competitive and supports higher interest rates. Hence, small business loans - the specialty of small banks - may be profitable even though such loans are costlier to make because of their informational requirements. Calem (1993) argued that small banks are better equipped to serve small borrowers because they have shorter lines of command and have advantages offering personalized services. Calem hypothesized that many small banks will survive in the long run by targetting niches with limited competition, and used data from California and Florida to support his hypothesis. For example, California has had unrestricted statewide branching since 1927 and regional interstate banking since 1987, and as of 1993 it had 5 of the 25 largest U.S. banking organizations, as well as 343 community banks with less than \$200 million in assets. In summary, the available empirical evidence suggests that the sustainable long-run market share of small banking organizations is smaller than that observed in the 1980s but away from zero.

## **2. Effects on Borrowers and on Depositors**

If, as argued earlier, the merger and branching trends in the banking industry are consistent with a more competitive environment, the economic analysis by Dunham indicates that the effect on large corporate borrowers is positive, and the net effect on small borrowers is ambiguous although most likely positive. *Ceteris paribus*, competition exerts a positive effect on

all borrowers by yielding more favorable loan terms due to lower interest margins. In addition, all borrowers benefit from the improved accessibility and convenience provided by increased branching (Calem 1994). Large corporate borrowers gain from mergers and branching because larger banks tend to be more oriented towards larger businesses (Nakamura, Keeton).

Geographic portfolio diversification by banking organizations allows them to lend to riskier borrowers, thus increasing credit availability to individual and small business borrowers. However, larger banking organizations focus less on small borrowers (Keeton).<sup>6</sup> Also, BHCs with branches may use local funds to make nonlocal loans, thereby benefiting borrowers at the location importing funds but hurting small borrowers at the location exporting funds (because small borrowers have fewer alternative loan sources).

The likely effects of the merger and branching trends on depositors are analogous to those on borrowers (Dunham). Assuming that merger and branching are procompetitive, it may be concluded that their effect on large depositors is positive, and that their effect on small depositors is ambiguous but most likely positive.

### **3. Effects on Taxpayers**

The structural changes observed in the banking industry may well have significant impacts on taxpayers. As argued by the “too-big-to-fail” doctrine, governments may not allow banking organizations to fail if they are so large as to affect the economy as a whole. In such instances, regulators may have to bail out such institutions with taxpayers’ money. However, it may also be argued that larger institutions are less likely to fail because of their ability to diversify their portfolios.<sup>7</sup> Despite the importance of this issue and the large negative impact on taxpayers of the financial debacle of the 1980s, there is a notorious lack of empirical work in this area.

### **4. Effects on Economic Activity**

One of the major reasons for opposing branching and interstate banking has been the claim that banking organizations headquartered in a different area might hurt the local economy by draining funds out of it. In this regard, Dunham (1986) found that small banks are more community-oriented, but they are actually net exporters of funds. According to Dunham, mergers have two opposing effects. First, mergers are conducive to more services and therefore likely to increase the supply of funds to larger local businesses. Second, mergers expand the possibilities of investing nonlocally. The net effect on the flow of funds depends on which of the two effects dominates. For rural banks, it seems likely that the second effect will outweigh the first effect, thereby leading to a net outflow of funds.

---

<sup>6</sup> However, some large interstate banking institutions (e.g., Norwest and KeyCorp) have targeted consumers and small to midsize businesses (Svare).

<sup>7</sup> It must be noted, however, that Boyd and Graham found that large banking organizations have failed more often than their smaller counterparts.

As discussed earlier, the changes observed in banking structure are likely to affect the probability of failure of banking organizations. The available empirical evidence indicates that bank failures have an adverse effect on economic activity in the communities where the failed banks are located (Gilbert and Kochin), and that there is a positive and significant relationship between the health of local credit institutions and economic activity at the state level (Samolyk 1991). In addition, Samolyk (1994a) found that banking-sector problems constrain economic activity in regions that are financially distressed. Clearly, this evidence suggests that economic activity as a whole will benefit if the recent banking trends are associated with a healthier banking structure. Unfortunately, there is no empirical work assessing directly the effect of recent banking trends on the financial health of the banking industry.

### **A Research Agenda**

The present review of the empirical literature on structural changes in the banking industry allows us to draw the following conclusions regarding the current status of our knowledge. First, there are some areas that have been thoroughly studied, and which seem to yield consistent results. Among others, such areas include most of the economic forces driven by banks' stockholders (i.e., bank efficiency, market power, and portfolio diversification) and the relaxation of branching and interstate banking restrictions. The marginal knowledge provided by additional research in these topics is likely to be low in relative terms. Second, there are some other areas that have either been addressed by too few studies (e.g., managerial incentives to increase size of banking organizations) or have yield mixed results thus far (e.g., the "too-big-to-fail" doctrine). Further research on these issues is likely to provide significant additions to our current body of knowledge. Third, many other areas have not been addressed at all by applied studies. Examples of issues that have not been analyzed empirically include many of the economic forces driven by banks' managers, various government actions as causes of structural changes in banking, and the effect on taxpayers of the recent changes in banking structure. As discussed earlier, most of such issues appear to be of sufficient relevance to warrant at least some investigation.

## References

- Adkisson, J. A., and D. R. Fraser. "The Effect of Geographical Deregulation on bank Acquisition Premiums." *Journal of Financial Services Research* 4(1990):143-155.
- Allen, L., and A. S. Cebenoyan. "Bank Acquisitions and Ownership Structure: Theory and Evidence." *Journal of Banking and Finance* 15(1991):425-448.
- Amel, D. F. "Trends in the Structure of Federally Insured Depository Institutions, 1984-94." Washington, D.C., Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin* (January 1996):1-15.
- Benston, G. J., W. C. Hunter, and L. D. Wall. "Motivations for Bank Mergers and Acquisitions - Enhancing the Deposit Insurance Put Option Versus Earnings Diversification." *Journal of Money, Credit, and Banking* 27(1995):777-788.
- Berger, A. N., and D. B. Humphrey. "The Dominance of Inefficiencies over Scale and Product Mix Economies in Banking." *Journal of Monetary Economics* 28(1991):117-148.
- Berger, A. N., W. C. Hunter, and S. G. Timme. "The Efficiency of Financial Institutions: A Review and preview of Research Past, Present, and Future." *Journal of Banking and Finance* 17(1993):221-249.
- Black, F. "Bank Funds Management in an Efficient Market." *Journal of Financial Economics* 2(1975):323-339.
- Boyd, J. H., and M. Gertler. "The Role of Large Banks in the Recent U.S. Banking Crisis." Federal Reserve Bank of Minneapolis, *Quarterly Review* (Winter 1994a): 2-21.
- Boyd, J. H., and M. Gertler. "Are Banks Dead? Or Are the Reports Greatly Exaggerated?" Federal Reserve Bank of Minneapolis, *Quarterly Review* (Summer 1994b):2-23.
- Boyd, J. H., and S. L. Graham. "Investigating the Banking Consolidation Trend." Federal Reserve Bank of Minneapolis, *Quarterly Review* (Spring 1991):3-15.
- Calem, P. S. "The Impact of Geographic Deregulation on Small Banks." Federal Reserve Bank of Philadelphia, *Business Review* (November/December 1994):17-31.
- Calem, P. S. "The Proconsumer Argument for Interstate Branching." Federal Reserve Bank of Philadelphia, *Business Review* (May/June 1993):15-29.
- Calem, P. S. "Interstate Bank Mergers and Competition in Banking." Federal Reserve Bank of Philadelphia, *Business Review* (January/February 1987):3-14.

- Calem, P. S., and L. I. Nakamura. "Branch Banking and the Geography of Bank Pricing." Federal Reserve Bank of Philadelphia, Working Paper No. 94-19, 1994.
- Clair, R. T. "Branch Banking in Texas: Implications for Bank Structure." Federal Reserve Bank of Dallas, *Economic Review* (September 1987):1-12.
- Clark, J. A. "Economies of Scale and Scope at Depository Financial Institutions: A Review of the Literature." Federal Reserve Bank of Kansas City, *Economic Review* (1988):16-33.
- Curry, T. J., and J. T. Rose. "Diversification and Barriers to Entry: Some Evidence from Banking." *Antitrust Bulletin* 29(1984):759-779.
- Curry, T. J., and J. T. Rose. "Multibank Holding Companies: Recent Evidence on Competition and Performance in Banking Markets." *Journal of Bank Research* 14(1983):212-220.
- DeYoung, R., and G. Whalen. "Banking Industry Consolidation: Efficiency Issues." Jerome Levy Economics Institute, Bard College, Working Paper no. 110, 1994.
- Dunham, C. R. "Interstate Banking and the Outflow of Local Funds." Federal Reserve Bank of Boston, *New England Economic Review* (March/April 1986):7-19.
- Evanoff, D. D. "Branch Banking and Service Accessibility." *Journal of Money, Credit, and Banking* 20(1988):191-202.
- Featherstone, A. M., and C. B. Moss. "Measuring Economies of Scale and Scope in Agricultural Banking." *American Journal of Agricultural Economics* 76(1994):655-661.
- Federal Reserve Bank of Chicago. *FDICIA: An Appraisal*. Chicago: Federal Reserve Bank of Chicago, 1993.
- Gilbert, R. A. "Bank Market Structure and Competition: A Survey." *Journal of Money, Credit, and Banking* 16(1984): 617-644.
- Gilbert, R. A., and M. T. Belongia. "The Effects of Affiliation with Large Bank Holding Companies on Commercial Bank Lending to Agriculture." *American Journal of Agricultural Economics* 70(1988):68-78.
- Gilbert, R. A., and L. A. Kochin. "Local Economic Effects of Bank Failures." *Journal of Financial Services Research* 3(1989):333-345.
- Goldberg, L. G., and G. A. Hanweck. "What We Can Expect from Interstate Banking." *Journal of Banking and Finance* 12(1988):51-67.
- Goldberg, L. G., G. A. Hanweck, and T. F. Sugrue. "Differential Impact on Bank Valuation of Interstate Banking Law Changes." *Journal of Banking and Finance* 16(1992):1143-1158.

- Grabowski, R., N. Rangan, and R. Rezvanian. "Organizational Forms in Banking: An Empirical Investigation of Cost Efficiency." *Journal of Banking and Finance* 17(1993):531-538.
- Hannan, T. H., and J. N. Liang. "Inferring Market Power from Time-Series Data: The Case of the Banking Firm." *International Journal of Industrial Organization* 11(1993):205-218.
- Hanweck, G. A., and S. A. Rhoades. "Dominant Firms and Local Market Competition in Banking." *Journal of Economics and Business* 36(1984):391-402.
- Holder, C. L. "The Use of Mitigating Factors in Bank Mergers and Acquisitions: A Decade of Antitrust at the Fed." Federal Reserve Bank of Atlanta, *Economic Review* (March/April 1993a):32-44.
- Holder, C. L. "Competitive Considerations in Bank Mergers and Acquisitions: Economic Theory, Legal Foundations, and the Fed." Federal Reserve Bank of Atlanta, *Economic Review* (January/February 1993b):23-36.
- Humphrey, D. B. "Why Do Estimates of Bank Scale Economies Differ?" Federal Reserve Bank of Richmond, *Economic Review* (September/October 1990):38-50.
- Kaufman and Mote. "Is Banking a Declining Industry? A Historical Perspective." Federal Reserve Bank of Chicago, *Economic Review* (Second Quarter 1995):45-57.
- Keeton, W. R. "Multi-Office Bank Lending to Small Businesses: Some New Evidence." Federal Reserve Bank of Chicago, *Economic Perspectives* (May/June 1994):2-21.
- Kuester, K. A., and J. M. O'Brien. "Market-Based Deposit Insurance Premiums: An Evaluation." Washington, D.C., Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series 150, 1991.
- Kwan, S. H., and R. A. Eisenbeis. "An Analysis of Inefficiencies in Banking: A Stochastic Cost Frontier Approach." Federal Reserve Bank of San Francisco, *Economic Review* (1996, No. 2):16-26.
- Laderman, E. S., and R. J. Pozdena. "Interstate Banking and Competition: Evidence from the Behavior of Stock Returns." Federal Reserve Bank of San Francisco, *Economic Review* (Spring 1991):32-47.
- Laderman, E. S., R. H. Schmidt, and G. C. Zimmerman. "Location, Branching, and Bank Portfolio Diversification: The Case of Agricultural Lending." Federal Reserve Bank of San Francisco, *Economic Review* (Winter 1991):24-38.
- Lawrence, D. B., and M. R. Klugman. "Interstate Banking in Rural Markets: The Evidence from the Corn Belt." *Journal of Banking and Finance* 15(1991):1081-1091.

- Liang, N., and S. A. Rhoades. "Geographic Diversification and Risk in Banking." *Journal of Economics and Business* 40(1988):271-284.
- Linder, J., and D. Crane. "Bank Mergers: Integration and Profitability." *Journal of Financial Services Research* 7(1992):35-55.
- Martin, J. D., S. H. Cox, and R. D. MacMinn. *The Theory of Finance - Evidence with Applications*. New York: The Dryden Press, 1988.
- McColl, H. L., Jr. "Required Reading: Updated Recipe for International Success." *American Banker* 156 (February 1991):4-7.
- Mester, L. J. "Efficient Production of Financial Services: Scale and Scope Economies." Federal Reserve Bank of Philadelphia, *Business Review* (January/February 1987):15-25.
- Moore, R. R. "Does Geographic Liberalization Really Hurt Small Banks?" Federal Reserve Bank of Dallas, *Financial Industry Studies* (December 1995):1-12.
- Nakamura, L. I. "Small Borrowers and the Survival of the Small Bank: Is Mouse Bank Mighty or Mckey?" Federal Reserve Bank of Philadelphia, *Business Review* (November/December 1994):3-15.
- Neff, D. L., B. L. Dixon, and S. Zhu. "Measuring the Efficiency of Agricultural Banks." *American Journal of Agricultural Economics* 76(1994):662-668.
- Newman, J., and R. Shrieves. "The Multibank Holding Company Effect on Cost Efficiency in Banking." *Journal of Banking and Finance* 17(1993):709-732.
- Nolle, D. E. "Banking Industry Consolidation: Past Changes and Implications for the Future." Jerome Levy Economics Institute, Bard College, Working Paper no. 111, 1994.
- O'Hara, M., and W. Shaw. "Deposit Insurance and Wealth Effects: The Value of Being 'Too Big to Fail.'" *Journal of Finance* 45(1990):1587-1600.
- Pederson, G. D. "Agricultural Bank Portfolio Adjustments to Risk." *American Journal of Agricultural Economics* 74(1992):672-681.
- Remolona, E. M., and K. C. Wulfekuhler. "Finance Companies, Bank Competition, and Niche Markets." Federal Reserve Bank of New York, *Quarterly Review* (Summer 1992):25-38.
- Rhoades, S. A. "Bank Mergers and Industrywide Structure, 1980-94." Washington, D.C., Board of Governors of the Federal Reserve System, Staff Study 169, 1996.



- Rhoades, S. A. "A Summary of Merger Performance Studies in Banking, 1980-93, and an Assessment of the 'Operating Performance' and 'Event Study' Methodologies." Washington, D.C., Board of Governors of the Federal Reserve System, Staff Study 167, 1994.
- Rose, J. T., and J. D. Wolken. "Geographic Diversification in Banking, Market Share Changes, and the Viability of Small Independent Banks." *Journal of Financial Services Research* 4(1990):5-20.
- Samolyk, K. A. "Banking Conditions and Regional Economic Performance - Evidence of a Regional Credit Channel." *Journal of Monetary Economics* 34(1994a):259-278.
- Samolyk, K. A. "U.S. Banking Sector Trends: Assessing Disparities in Industry Performance." Federal Reserve Bank of Cleveland, *Economic Review* (Second Quarter 1994b):2-17.
- Samolyk, K. A. "A Regional Perspective on the Credit View." Federal Reserve Bank of Cleveland, *Economic Review* (Second Quarter 1991):27-38.
- Savage, D. T. "Interstate Banking: A Status Report." Washington, D.C., Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin* (December 1993):1075-1089.
- Shaffer, S. "Bank Competition in Concentrated Markets." Federal Reserve Bank of Philadelphia, *Business Review* (March/April 1994):3-16.
- Shaffer, S. "Challenges to Small Banks' Survival." Federal Reserve Bank of Philadelphia, *Business Review* (September/October 1989):15-27.
- Smith, H. H. "Agricultural Lending: Bank Closures and Branch Banking." Federal Reserve Bank of Dallas, *Economic Review* (September 1987):27-38.
- Spong, K. *Banking Regulation: Its Purposes, Implementation, and Effects*, 4th edition. Kansas City, MO: Federal Reserve Bank of Kansas City, 1994.
- Svare, J. C. "NationsBank Leads Charge for Interstate Branching." *Bank Management* 68(June 1992):36-41.
- Wheelock, D. C. "Is the Banking Industry in Decline? Recent Trends and Future Prospects from a Historical Perspective." Federal Reserve Bank of St. Louis, *Review* 75(September/October 1993):3-22.

Figure 1: Number of U.S. banks and banking organizations, 1980-1994.

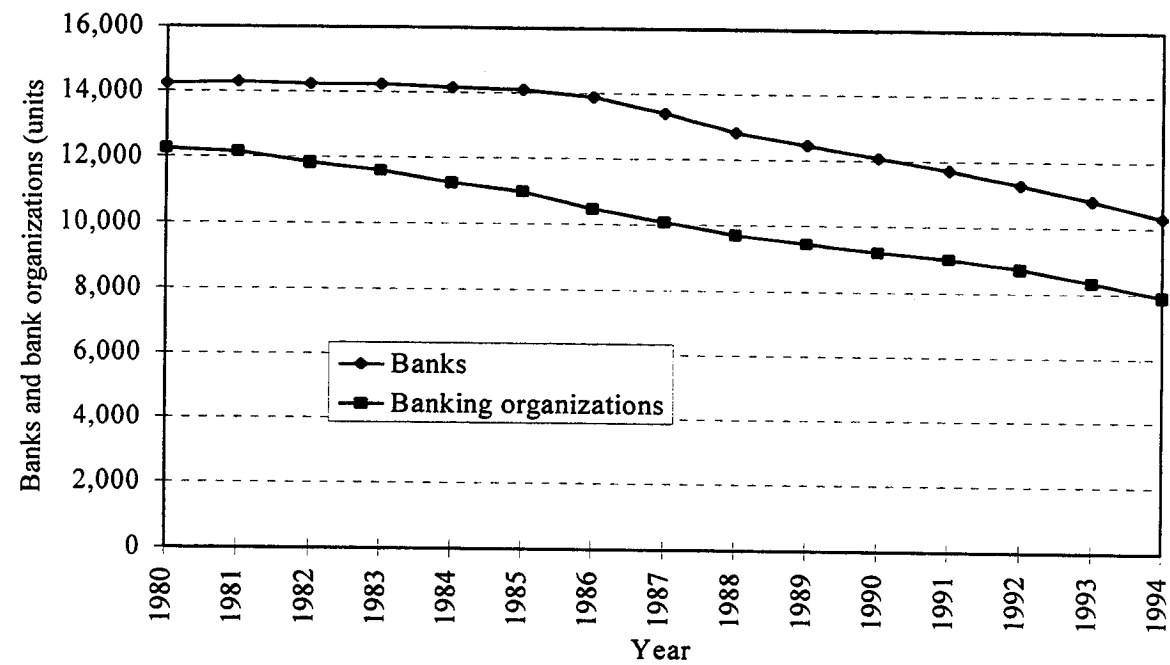


Figure 2: Total value of assets held by U.S. commercial banks in current dollars and in constant dollars of 1987, 1980-1994.

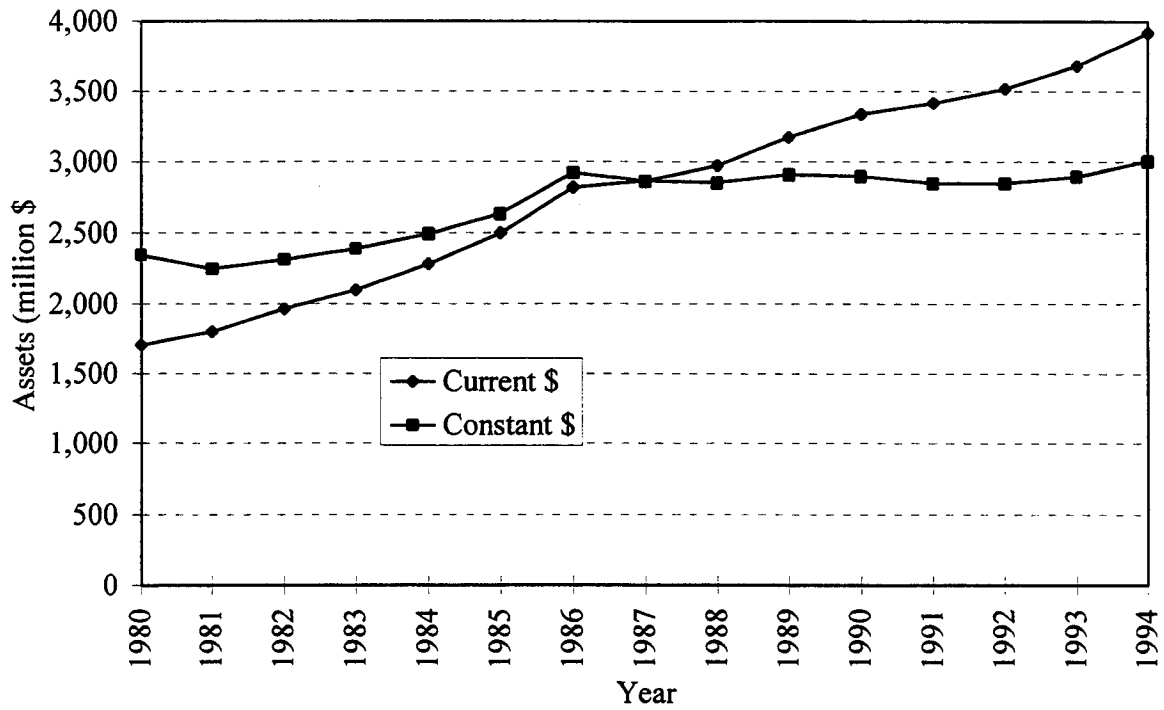
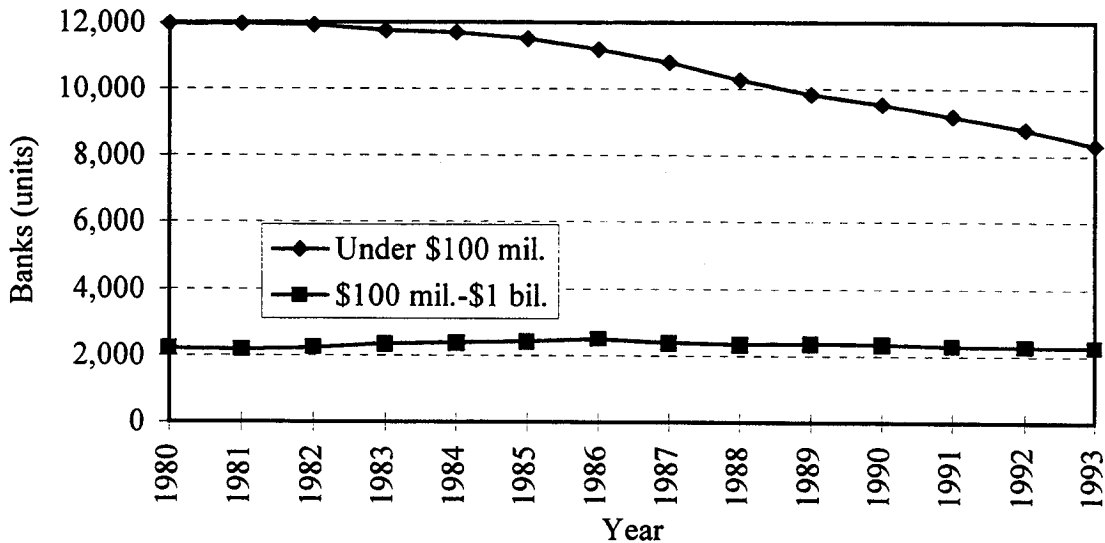


Figure 3: Number of U.S. banks by asset size in constant dollars of 1987, 1980-1993.

a. Number of banks with assets under \$100 million, and with assets between \$100 million and \$1 billion.



b. Number of banks with assets between \$1 billion and \$10 billion, and with assets over \$10 billion.

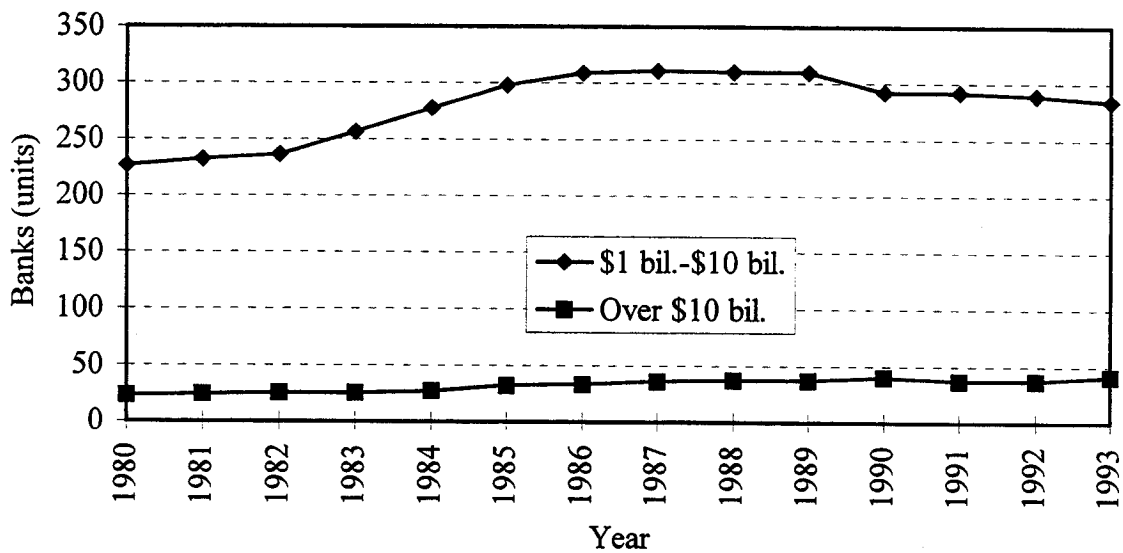


Figure 4: Composition of net changes in the number of U.S. banks, 1980-1994.

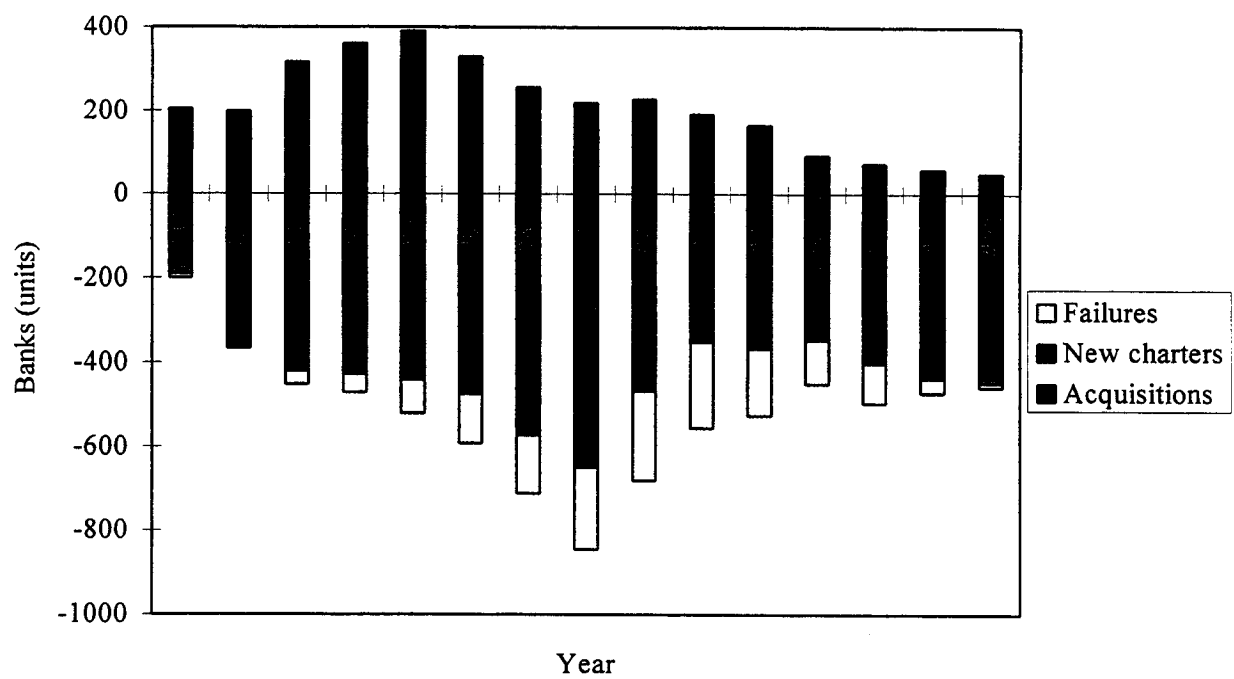


Figure 5: Number of U.S. bank holding companies and independent banks, 1980-1993.

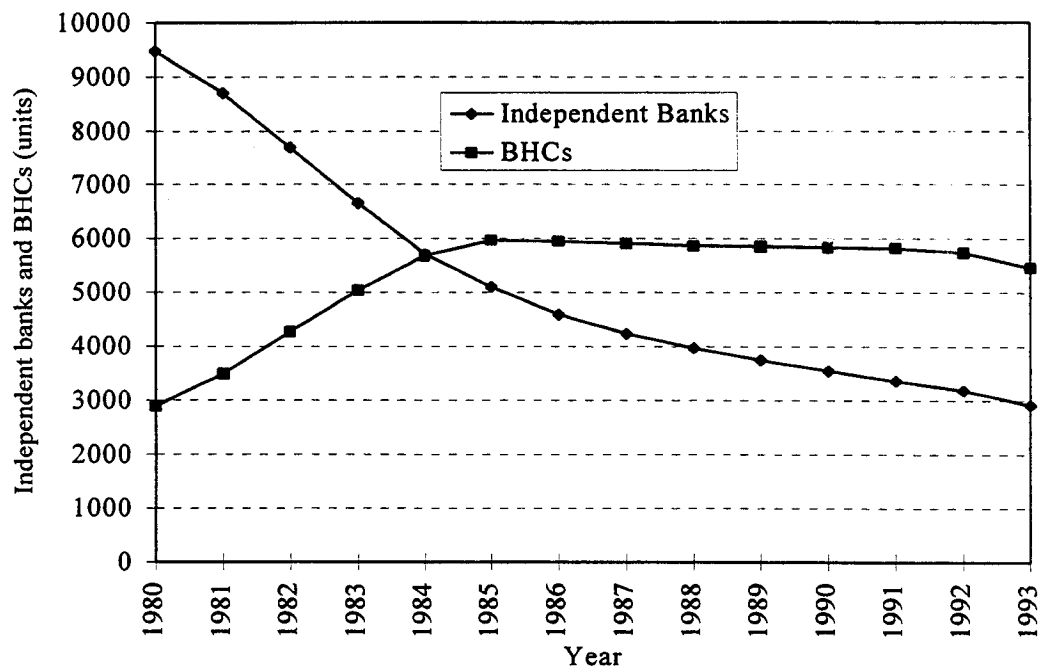


Figure 6: Number of U.S. one-bank holding companies and multiple-bank holding companies, 1980-1993.

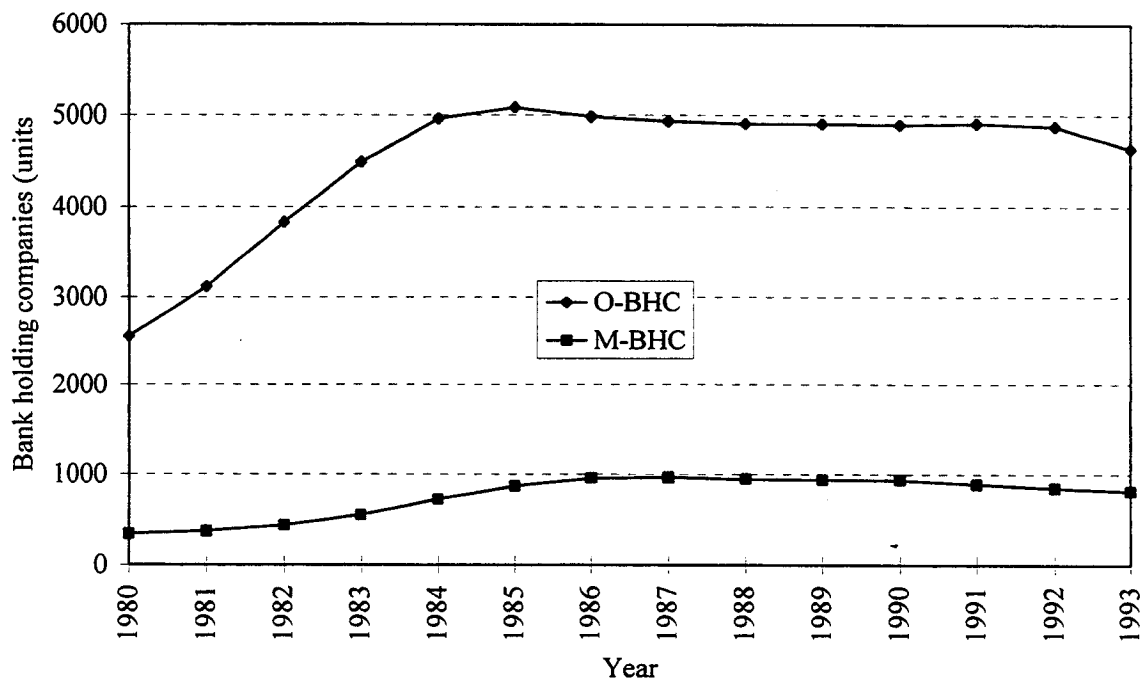


Figure 7: Proportion of deposits held by largest U.S. banking organizations, 1980-1994.

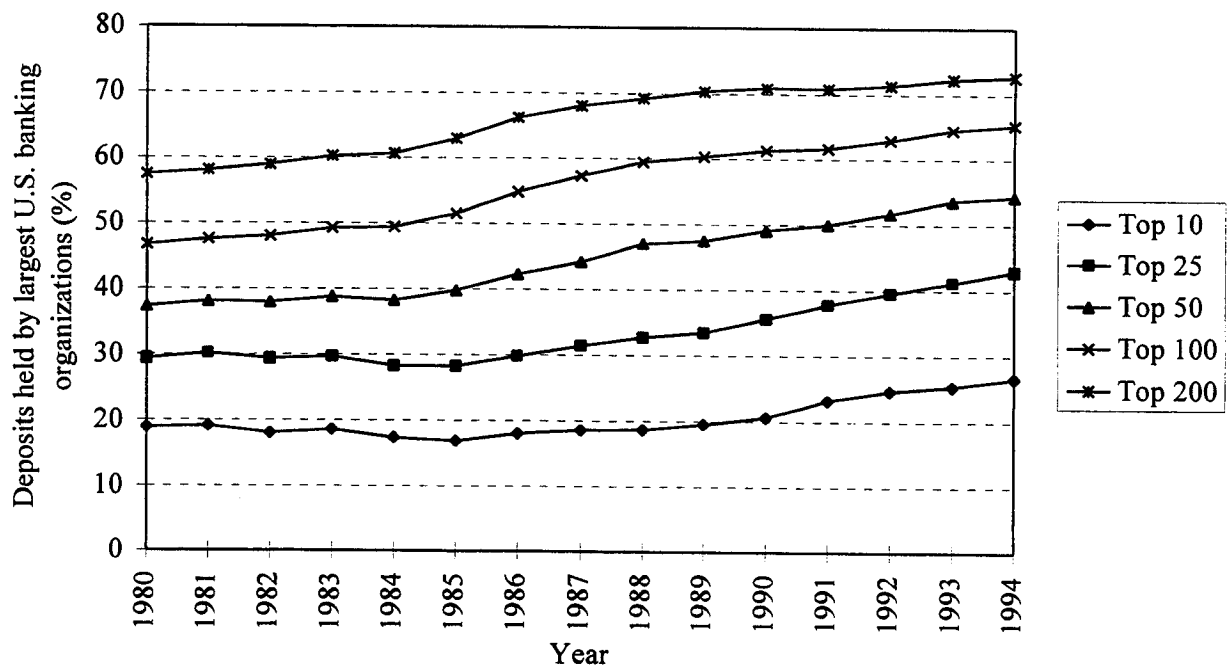


Figure 8: Number of U.S. bank branches, banking offices, and ATMs, 1980-1994.

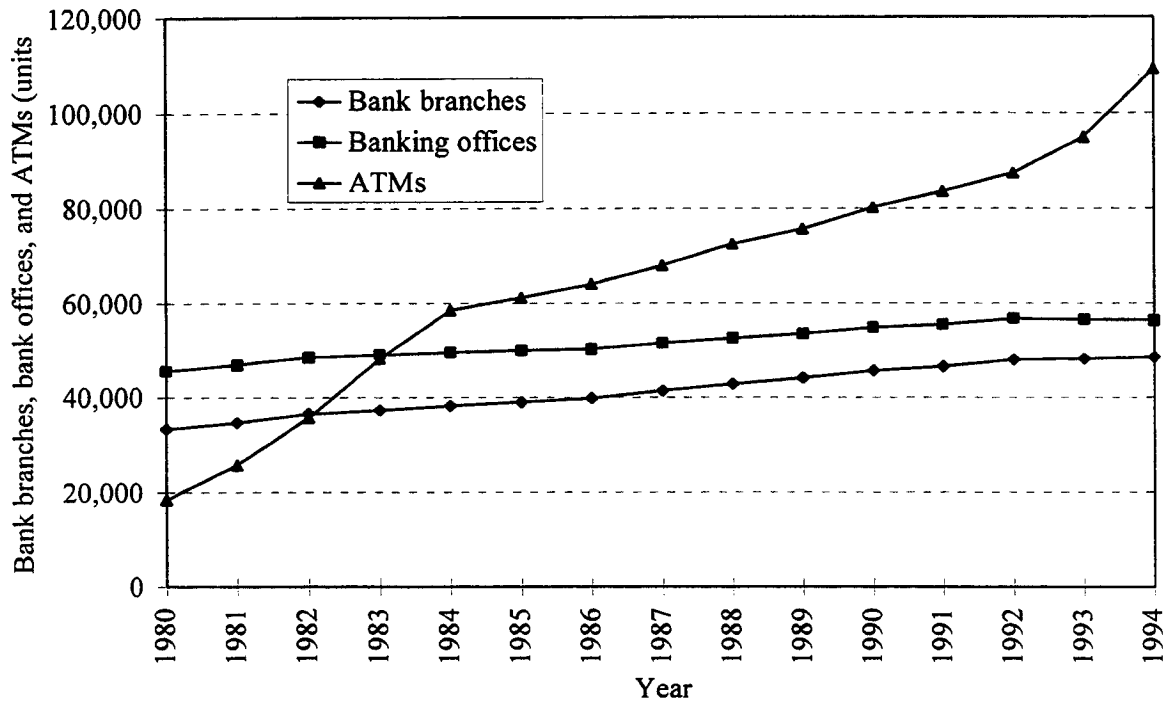




Figure 9: Proportion of deposits held by the three largest banking organizations in metropolitan and non-metropolitan statistical area counties, 1980-1994.

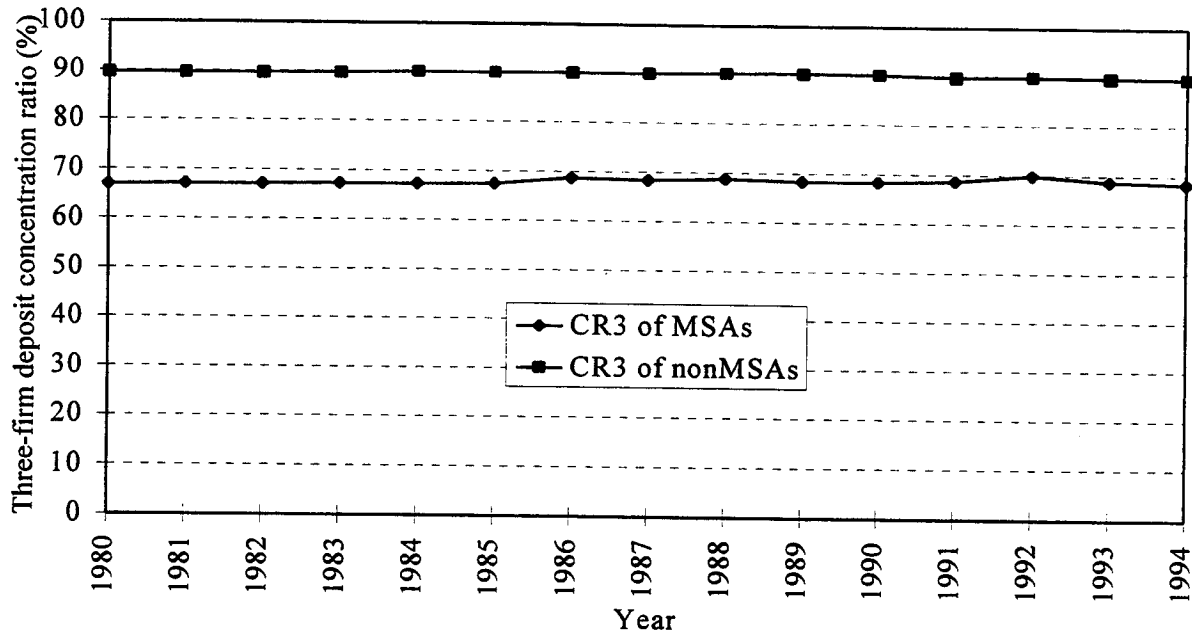


Figure 10: Herfindahl-Hirschman Index in metropolitan and non-metropolitan statistical area counties, 1980-1994.

