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The Changing Business of Banking: A Study of Failed Banks from 1987 to 1992

THE CHANGING BUSINESS OF BANKING: A STUDY OF FAILED BANKS FROM 1987 TO 1992

The Congress of the United States
Congressional Budget Office

NOTES

Numbers in the text and tables may not add to totals because of rounding.

Cover photo shows a run on a bank in New York City in 1987 (The Bettmann Archive).

Preface

Since the Banking Act of 1933 established the Federal Deposit Insurance Corporation, the FDIC has resolved about 2,000 banks. More than 1,000 of these resolutions occurred in the six years between 1987 and 1992. The dramatic increase in the number and costs of resolutions in this period, coming on the heels of the savings and loan crisis, raises questions about the long-term condition of the banking industry and the Bank Insurance Fund.

This study, which was prepared in response to a request from the Senate Committee on Banking, Housing, and Urban Affairs, examines major factors contributing to bank failures during this six-year period and why these failures resulted in such extraordinary resolution costs. It examines bank-specific factors such as asset quality and portfolio composition, as well as more general structural and economic conditions affecting the industry. In keeping with the mandate of the Congressional Budget Office (CBO) to provide objective analysis, this study makes no recommendations.

Patrice L. Gordon and Thomas Lutton (currently at the Office of the Comptroller of the Currency, Bank Research Division) wrote the study, under the supervision of Jan Paul Acton and Elliot Schwartz of CBO's Natural Resources and Commerce Division. Aaron Zeisler, Michael Crider, and Veronica French provided research assistance. Kim Kowalewski, Bruce Vavrichek, Robin Seiler, Jim Hearn, Mark Booth, and Ron Feldman of CBO offered comments and helpful suggestions. The authors wish to thank George Kaufman, George French, James Thompson, James Barth, R. Dan Brumbaugh, Robert Litan, Philip F. Bartholomew, Larry Mote, Harold A. Black, and Haluk Unal for their constructive comments.

Sherwood D. Kohn edited the manuscript, and Christian Spoor provided editorial assistance. Gwen Coleman and Angela Z. McCollough produced the numerous drafts. With the assistance of Regina Washington and Martina Wojak-Piotrow, Kathryn Quattrone prepared the study for publication.

Robert D. Reischauer
Director

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Summary

The history of banking in the United States is like a volatile stock market, characterized by wide fluctuations in profitability and decline. In the 35 years between 1885 and 1920, the number of U.S. banks tripled from 10,000 to 30,000. It took only five years--from 1929 through 1933--for the number of banks in the industry to shrink by one-half. This period of rapid decline was associated with deteriorating industries, depressed regions, and to some extent with runs on banks. Concern about the soundness of the industry was a catalyst for the Banking Acts of 1933 and 1934. These acts restricted competition and established the deposit insurance system.

The 1980s was also a turbulent decade for the U.S. banking industry. It ushered in intense domestic and international competition in financial markets. A peculiar confluence of economic forces, technical innovation, and deregulation contributed to an unprecedented number of bank failures and subsequent resolutions during the late 1980s and early 1990s. During the six years from 1987 through 1992, more than 1,000 bank resolutions (commercial and savings banks) cost the Bank Insurance Fund (BIF) about $30 billion, exhausting an $18 billion reserve in the deposit insurance system. The sheer number of bank failures and the extensive losses to the deposit insurance fund during the 1987-1992 period dwarfed the experience of the previous five decades. In conjunction with a crisis in the thrift industry, the bank failures and losses caused by the banks' resolutions brought about the first real challenge to the deposit insurance system.

The banking crisis may indeed be over. But what were the underlying causes of the failures, and why were the costs of resolving these banks so much higher than those in previous periods? Some of the factors associated with bank failures occurring over this six-year period could reemerge and once again expose some banks to increased risk of loss. Evidence from this turbulent period may be valuable in assessing the condition of the industry as it undergoes continued structural change and consolidation.

Why Did Banks Fail?

Banks failed for many reasons. Local market and macroeconomic influences, the regulatory environment, and management performance all contributed to the tendency of banks to fail and to the size of associated losses. Surveys reveal that fraud and abuse also contributed to failure, but those factors were primary causes in only 25 percent of the cases. Most banks failed because a significant portion of their asset portfolios defaulted; in other words, these banks made what turned out to be bad loans.

Many of the problems with loans that became apparent after the mid-1980s probably originated in the late 1970s and early 1980s. Two dramatic surges in inflation during the 1970s changed the business of banking. Both inflationary periods led to sharp rises in commodity prices, mercurial stock and bond prices, and particularly volatile interest rates. Initially, market interest rates climbed while regulated interest rates on deposits remained capped at 5.25 percent. Although ceilings on deposit interest rates had been in place for decades, banks had

still been able to attract depositors. But once market interest rates exceeded the caps, depositors began to look elsewhere. By the early 1980s, disintermediation--the diversion of savings from accounts having low interest rates to direct investment in high-yielding instruments--had become a problem.

The double-digit interest rates available on money market mutual funds, Treasury securities, and other nondepository financial instruments made them popular alternatives to banks and thrifts. Banks could not legally compete with the products or rates offered by other financial institutions. After an outcry from banks and thrifts, regulated interest rate ceilings were phased out over a six-year period, starting in 1980 with the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA). Banks were also permitted to offer a broader array of financial products. After DIDMCA, banks were better able to compete with other financial intermediaries for depository funds, but much of the damage was already done. At the beginning of the 1980s banks were in a weakened state.

Advances in computers, telecommunications, and other forms of technology greatly improved the dissemination and flow of financial information. Competition by other banks, thrifts, money market funds, and other nonbank financial institutions intensified. Bank earnings and rates of return from traditional activities suffered throughout the 1980s. By the end of the 1980s, new financial instruments proliferated. Banks became more dependent on off-balance sheet activities such as interest rate swaps, loan commitments, and future markets for exchange rates for income. Shares of assets of nonbank financial institutions grew dramatically. Meanwhile, the share of financial assets held by banks decreased steadily throughout the 1980s.

Competition took many forms, but banks--especially big banks with assets greater than $10 billion --lost ground in major markets, including that for large industrial borrowers with excellent credit ratings. These "blue-chip borrowers," formerly the mainstays of bank lending, defected for more favorable lending rates in commercial paper markets. Banks had to adjust their asset portfolios. They could no longer look to less risky commercial and industrial loans to bolster their earnings; the development of the commercial paper market had made these loans more difficult to obtain. As a result, commercial and industrial loans declined as a percentage of bank portfolios.

Faced with fewer investment alternatives, some banks sought refuge in higher-risk assets, including loans to developing countries and energy investments in the 1970s and 1980s. When oil prices fell and defaults on loans to developing countries increased in the 1980s, banks that had not properly diversified lost large portions of their asset portfolios. In some cases, banks turned to highly leveraged transactions and junk bonds in an effort to bolster sagging earnings. The subsequent softening of these markets resulted in substantial losses in bank earnings and equity. Rates of return for many banks dropped far below past averages. Bad loans began to surface, and provisions for bad loans began to overwhelm the income on good loans. Returns on equity in some of the largest banks were less than returns on government bonds.

Analysis of industry data reveals a strong pattern of higher-than-average bank failure associated with regions experiencing temporary economic difficulties. Banks tied to regional markets suffered from economic declines in energy, real estate, and agriculture. For example, bank failures in the Southwestern states can be attributed in part to regional collapses in oil and real estate prices. Texas banks were hit particularly hard by sectoral declines in the local oil and gas market and subsequent slumps in local real estate markets. Real-estate-related difficulties spread to the Northeast, the Southeast, and finally the West Coast. Bank failures in the West and Midwest regions can be linked to a downturn in the agriculture sector during the mid-1980s.

Although many of the problems that beset banks were externally induced, the primary responsibility for bank failures rests squarely on the shoulders of bank managers and boards of directors. This responsibility does not negate ineffective regulation or unforeseen economic developments as causes of failure, but the bank manager is the agent who reacts to economic conditions and the regulatory environment. Some managers made mistakes be-

cause they reacted incorrectly to a barrage of unusual factors. In some cases, managers simply failed to diversify asset portfolios and boards of directors did not insist on reasonable loan practices. Managers of failed banks often pursued aggressive loan policies without reasonable precautions against default. As a result, many bank managers who failed to deal effectively with increased competition and adverse economic shocks presided over the demise of their institutions.

A comparison of the financial characteristics of banks that failed and banks that survived is revealing. It shows that some of the traits that distinguish resolved and surviving banks began appearing in the institutions' balance sheets years before they failed. Industry data show that surviving banks were more likely to have higher equity-to-asset ratios (measured by book value) and lower loan-to-assets ratios than resolved banks had even three years before their resolution. Even with the limited data available, it is possible to infer that those banks that survived this period did so by holding more liquid assets, managing modest growth in diversified assets, maintaining a suitable buffer of capital, and complying with regulatory requirements. Banks that failed and were resolved experienced dramatic losses in book-value equity-to-asset ratios within one year of resolution--a relatively short period of time. Whatever caused the book-value equity ratios to fall so rapidly, the event has implications for regulatory efficiency in recognizing losses on assets and carrying out timely closure.

All resolutions were marked by one important regulatory decision--banks that were resolved could not raise capital. Regulators did not resolve a bank if it proved that it was capable of raising capital. Capital is simply defined as the difference between assets and liabilities--the equity held at book value. The act of raising additional capital is an act of validation--a market affirmation of the continued existence of a bank. Weakly capitalized banks may raise capital either by increasing income for retained earnings or by otherwise raising capital in the equity market. Surviving banks generated positive income and raised capital when it was required; failed banks were unable to do so.

Why Did Resolutions Cost So Much?

During the 1980s, regulators faced not only an increase in the number of bank failures requiring resolution, but also an increase in the average cost of resolving a bank. The cost to the BIF of resolving a bank depends on the value of liabilities covered by deposit insurance and the value of assets that can be recovered during the resolution process. Covered liabilities mostly include insured deposits. A major factor determining the cost of resolution is the loss on assets--that is, the difference between the book value of assets at the time of resolution and the net value that can be recovered if the assets are sold. As the recoverable value of assets decreases, the cost of resolving an institution increases. If banks are resolved when they first become insolvent on the basis of market value--that is, when liabilities are just greater than the market value of assets--losses to the fund can be held roughly to the administrative costs required to process the resolution through the FDIC system.

The average loss on assets for resolved banks in the late 1980s was about 30 percent. In the 1980s, most banks were closed when they became book-value insolvent--that is, when the book value of their equity dropped to zero. When asset values are declining, banks will generally be insolvent on a market-value basis before they display book-value insolvency. Because there was such a drain on the insurance fund, recognition of bank insolvency and a timely exit policy for insolvent institutions became a critical part of regulatory effectiveness.

The fact that losses were, on average, higher in the 1980s than they were in the previous period may indicate diminished regulatory effectiveness. Two factors could have contributed to diminished effectiveness. First, examiners may not have been able to identify potential failures early enough to permit regulators to avoid additional losses. Although bank examiners can usually determine which banks are financially distressed, judging when a bank first becomes insolvent is very difficult.

Also, during this interval an extraordinary number of banks failed over a short period of time. Second, examiners may have identified severely undercapitalized banks, but either practiced a policy of forbearance or were unable to elicit compliance through supervision.

The process of classifying a bank as economically incapable of surviving before it reaches book value insolvency is fraught with uncertainty. Regulators can make two kinds of errors in classifying a bank as insolvent. First, they may classify a bank that is really functional as insolvent. In the second case, regulators may classify a bank that is really insolvent as functional.

In the history of the insurance fund, the two errors have not been equally important. Since 1934, regulators have rarely resolved a bank that was solvent by book-value measures. During the 1980s, regulators usually preferred to err on the side of leaving a financially distressed bank operating rather than close a functional bank. The costs associated with behaving as though a bank is functional when it is not can appear eventually as embedded costs that show up as relatively high resolution costs per dollar of assets. Regulators also faced legal and economic pressures to avoid closing a bank before it became book-value insolvent. To close such institutions meant that the regulators would have had to endure immediate vocal disapproval from those directly affected--owners of banks, boards of directors, local communities, and their representatives. Beneficiaries of timely closures were conspicuously silent and typically unaware of the costs of regulatory delay.

Along with the problem that regulators may have been uncertain about when an institution became insolvent, regulators may have been simply overwhelmed by the events of the 1980s. In the context of new financial instruments and the greater latitude afforded banks by deregulation in the early 1980s, regulators may have been unable to keep up with the technological changes caused by deregulation and increased competition in the industry. On-site examinations, conducted to assess the financial health of an institution, were less frequent (as a result in part of budget cutbacks) at a time when financial markets were changing faster than at virtually any other point in the nation's history. Without relatively current assessments from examiners, regulators had to rely solely on quarterly call reports based on book-value data. Book-value data based on past transactions can overstate the current market value of a financially weak institution. When events in the market affect the value of an institution, book-value accounting does not reflect a change in value. Without data based on examination and the true value of assets, regulators could not easily recognize asset losses and bank insolvency.

A policy of forbearance gives economically functional banks--those that may be undergoing short-term difficulties--a window of time in which to adjust to market conditions without enforcing otherwise applicable bank regulations. Although not every undercapitalized bank is a likely candidate for resolution, all are unquestionably candidates for increased regulatory oversight and supervision. Regulators have the authority to force banks to raise equity, suspend dividends, reduce assets, issue new stock, force divestiture of affiliates, remove directors or managers, demand increased allowances for loan losses, or charge off uncollectible loans. Enforcing such actions on these undercapitalized banks may have resulted in even more failures. In some cases, regulators decided to forgo enforcement of supervisory actions--in particular, enforcing capital requirements--presumably because they felt that these banks would be more likely to survive rather than fail.

Post-FDICIA: An Outlook of Guarded Optimism for the Banking Industry

The Congress intended the deposit insurance system to be self-sustaining. Revenues collected from premium assessments paid by insured banks are used to cover the costs of resolving insolvent banks. For almost 50 years, the fund's revenues exceeded its costs. But the expense of resolving banks in the late 1980s drained the Bank Insurance Fund. By 1991, there was increasing concern about the numbers and losses of bank resolutions.

The financial condition of the banking industry and the ability of the federal deposit insurance fund to cover losses from the alarming number of resolutions in the 1980s were major motivating factors for passage of the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA). Along with recapitalizing the BIF (the FDIC is to recapitalize the insurance fund by 2005), a major theme of this legislation is to foster "safety and soundness" in the banking industry.

Because only little more than two years have elapsed since its passage, it is difficult to evaluate fully the effects of FDICIA. Nevertheless, the reforms put in place by this act appear to have addressed directly some of the major problems identified during the 1980s--a period that put considerable stress on the regulatory and deposit insurance systems. The FDICIA authorized the Federal Deposit Insurance Corporation to take prompt corrective action (or intervene earlier) to limit insurance losses. That is, bank regulators must employ regulatory constraints depending on whether a bank meets minimum prescribed capital levels. The act requires prompt closure of severely undercapitalized banks. In FDICIA, the Congress also charged the FDIC with the responsibility of putting into place a risk-based capital system and developing a risk-based premium system. Properly designed risk-based premiums will provide increased insurance funds to cover heightened risk in bank portfolios. A system of risk-based capital requirements, along with the mandated yearly on-site examinations, may provide a better buffer (to absorb losses on assets) between assets that default in a risky bank portfolio and bank insolvency that requires resolution.

After several years of poor performance, the banking industry earned record profits in 1992 and 1993. The average return on assets for commercial banks was 1.21 percent in 1993, a year in which the return on assets in each quarter surpassed averages previously reported by the industry. At the same time, the average annual return on equity for the industry exceeded 15 percent. Several factors contribute to the improved health of the banking industry even as the industry undergoes continued structural change and consolidation. In particular, favorable interest rate conditions and a growing economy have enabled banks to prosper. Banks have been able to take advantage of the fact that they can pay less for their liabilities and receive greater returns on assets. Moreover, the growing economy has helped to reduce the amount of troubled assets--noncurrent loans declined in all regions of the country and across all major loan categories--which means that banks do not have to set aside as much money to cover potential bad loans.

The outlook for the Bank Insurance Fund has improved as the banking industry continues to earn record profits. After incurring positive outlays from 1988 to 1992, the fund is now in the black. The fund's balance (net worth) rebounded to $6.8 billion in the second quarter of 1993, from a negative $100 million at the end of 1992 and a negative $7 billion at the end of 1991. In its January 1994 baseline, the Congressional Budget Office projected that the BIF will take in $8 billion more than it spends in fiscal year 1994 and continue in the black with a smaller excess in the next several years.

At the close of 1993, only 41 banks had been resolved through the BIF, the fewest resolutions in any year since 1982, when there were 42. The assets of banks resolved by the FDIC have been falling from a record $63.4 billion in 1991 to $44.2 billion in 1992 and only $3.6 billion in 1993. As a rule, larger banks are more costly to resolve. The average size of a resolved bank in 1993 was $87 million, down from $363 million in 1992.

The record profits in the two years following FDICIA tend to obscure the fact that the banking industry has been losing ground to other types of financial services. To some degree, however, banks are earning profits by taking advantage of low interest rates, which exposes them to increased interest-rate risk. Although favorable conditions for interest rates have allowed banks to increase profits and replenish their capital, their increased exposure to interest rate risk warrants a posture of guarded optimism. When economic conditions change so that the returns based on interest rate spreads narrow, it could expose some banks to increased risk of failure. Given the possibility that the industry may be susceptible to such periodic crises because of changing economic conditions, policymakers are examining the need for further structural reform in the banking industry. In particular, there is continu-

ing interest in legislative reform that would enable banks to diversify, either geographically or through various product offerings. An interstate branching bill currently under consideration by the Congress would permit banks to diversify their loan portfolios across state lines.

Chapter One

Introduction

Problems in the banking industry proliferated dramatically during the 1980s, and the number of bank resolutions reached levels not seen since the Great Depression. Since the Banking Act of 1933 established the Federal Deposit Insurance Corporation (FDIC), more than 2,000 troubled commercial and savings banks have been resolved. Banks resolved by the FDIC have either failed, requiring regulatory involvement in their exit from the industry, or needed some financial assistance to remain open. Between 1980 and 1992, the FDIC resolved almost three times as many banks (1,505 banks) as it resolved in the first 46 years of its existence (at many times the cost to the insurance fund). During the peak years between 1987 and 1992, the FDIC resolved more than 1,000 banks, seriously depleting the Bank Insurance Fund (BIF).

Before 1980, the solvency of the insurance fund was never an issue. Until the mid-1980s, revenues to the insurance fund, primarily derived from semiannual assessments of premiums, invariably exceeded losses. Regulators assessed premiums at the same flat rate used since the creation of the fund--8.3 cents per $100 of insured deposits. At the time, the FDIC (with Congressional authorization) commonly provided rebates of up to one-third of the overall annual premium assessments to avoid generating what was commonly thought of as an "excessive" insurance fund surplus.[1] Regulators considered the fund reserves more than sufficient to handle recognized fund losses, feeling that it was not necessary to increase premiums. In 1987, the BIF had an $18 billion reserve. But by 1991, the record number of resolutions had caused such a drain on insurance fund reserves that the General Accounting Office pronounced the Bank Insurance Fund insolvent.[2]

The dramatic increase in the number and costs of resolutions in the late 1980s, coming on the heels of the savings and loan crisis, brought into question the long-term condition of the deposit insurance fund. Taxpayers have paid dearly for the savings and loan insurance losses, a financial hemorrhage that may cost more than $150 billion (expressed in 1990 dollars) before it is finished.[3] Speculation that taxpayers would again have to come to the rescue of another ailing insurance fund sparked Congressional debate.

In addition to the immediate problem of losses to the Bank Insurance Fund, industry analysts were also concerned about the broad economic effects of bank failures. The average loss in asset value of banks and thrifts resolved during the 1980s was unprecedented in the history of deposit insurance. These losses were symptomatic of poor decisions by many depositories and weaknesses in the regulatory system of monitoring and supervision. Another

1. William E. Gibson, "Deposit Insurance in the United States: Evaluation and Reform," *Journal of Financial and Quantitative Analysis* (March 1972), pp. 1575-1594.

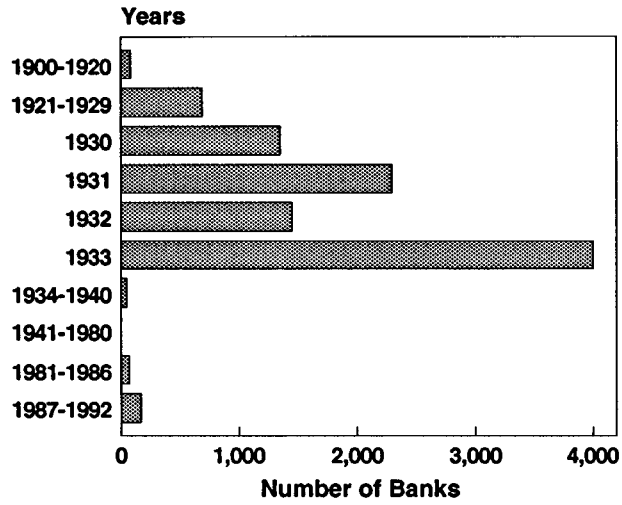
2. General Accounting Office, "Financial Audit: Bank Insurance Fund's 1991 and 1990 Financial Statements" (report to the Board of Directors, Federal Deposit Insurance Corporation, Washington, D.C., May 11, 1992). The insurance fund is *insolvent* when there are not sufficient reserves on hand to manage bank failures. Technically, however, the fund is never *illiquid* because the FDIC has the ability to borrow funds (up to $30 billion as of 1991) from the U.S. Treasury to handle resolutions and maintain working capital.

3. See Congressional Budget Office, *The Economic and Budget Outlook: Fiscal Years 1995-1999* (January 1994), p. 44.

cause of concern is that bad investments made with funds from depository institutions may have contributed to an overvalued capital stock and poor growth of productivity in the United States during the 1980s.

The alarming increase in the number of bank (and thrift) resolutions revealed the necessity for bank reform legislation. The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 and the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) were responses to the pressure put on the deposit insurance system because of the costs of resolving these institutions. As a result of these legislative actions and an increase in banking industry profits in 1992 that continued into 1993, concerns have abated somewhat. Among the most interesting questions remaining are why there was such an increase in bank failures and subsequent resolutions in the late 1980s and early 1990s. Also, why did the costs to the government of resolving failed banks increase so dramatically, depleting the BIF in just a few years?

Figure 1.
Average Annual Number of Bank Failures for Selected Periods Between 1900 and 1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation.

Bank Resolutions in Historical Perspective

In the early history of the U.S. banking industry, from 1870 to 1919, banks failed at a rate slightly lower than that of firms in other sectors of the economy.[4] In fact, the industry grew rapidly during this period. The number of commercial banks tripled in 35 years, growing from 10,000 in 1885 to 30,000 in 1920. Almost 500 banks failed in 1893, but from 1900 to 1920 the average rate of failure was less than 100 a year.[5] Circumstances began to change, however, in the 1920s.

During the 1920s, the banking industry began to contract. As many as 5,400 banks suspended operations and more than 4,000 never reopened. Nearly 700 banks failed every year during the 1920s (see Figure 1). A recession hit the agricultural sector in the late 1920s, accounting for the failure of many small rural banks. The Great Depression struck the entire economy in the early 1930s, causing record numbers of bank failures.

Between 1930 and 1933, the average number of annual bank failures reached an incredible 2,274. Within the five years from 1929 through 1933, the number of banks in the United States was cut almost in half, to about 14,700. Even during these crisis years, annual losses to depositors rarely exceeded 1 percent of total deposits at all banks. Losses at many of these banks were generally limited to less than 10 cents on the dollar.[6]

4. George Kaufman, "Banking Risk in Historical Perspective," *Research in Financial Services: Private and Public Policies*, vol. 1 (Chicago: JAI Press Inc., 1989), pp. 151-164.

5. George Benston and George Kaufman, "Risks and Failures in Banking: Overview, History, and Evaluation," in George G. Kaufman and Roger C. Kormendi, eds., *Deregulation of Financial Services: Public Policy in Flux* (Cambridge, Mass.: Ballinger Press, 1986).

6. James S. Lawrence, "What is the Average Recovery of Depositors?" *American Bankers Association Journal* (February 1931), pp. 655-656, 722-723.

During this period, in the absence of a system of deposit guarantees, banks were declared legally insolvent and closed by their creditors much more quickly than they were after deposit insurance.[7] Liquidity was much more costly in early financial markets because funds moved slowly through the system. If banks could not meet liquidity requirements, they would often voluntarily suspend operations. Bank examiners would then determine whether a bank had sufficient capital to reopen. The fact that banks were closed fairly quickly in a liquidity crisis helped to limit depositors' losses.

It is popularly supposed that many of these failed banks had fallen victim to deposit runs. But from 1865 to 1929, fewer than 15 percent of all bank failures occurred as a result of depositor runs.[8] Surprisingly few solvent banks were drawn into failure as depositors reacted in panic to losses at other insolvent banks.[9] Although there were severe systemwide runs in the early 1930s, a large proportion of the banks that failed were insolvent. Banks that the Federal Reserve supported (in the role of lender of last resort) tended to survive.[10]

Banking After the Depression

After the banking crisis of the early 1930s, the Banking Acts of 1933 and 1934 created the FDIC. These acts made the FDIC responsible for resolving banks when the state or federal chartering agency declared them insolvent, and for maintaining an insurance fund to protect depositors. Deposit insurance was supposed to immunize the system as a whole against a contagious response to individual bank failures, but in so doing it transferred the burden of monitoring individual institutions from the creditors of depositories to regulators. Before the deposit insurance system put guarantees in place, several parties, including investors and depositors, were interested in reducing their risk of loss. The risk of losing depositors and shareholders (in the case of national banks) generally influenced banks to keep their portfolio risk low. Depositors also pressured banks to hold more capital because the greater the amount, the more losses the bank could withstand before becoming insolvent and forcing losses on depositors.

The Post-Depression Incidence of Bank Resolutions. From 1934 onward, bank runs were virtually nonexistent. The average annual rate of banks resolved by the FDIC dropped well below preinsurance levels (see Figure 1). From 1934 to 1940, the average annual number of bank resolutions dropped dramatically to 64. During the next 40 years, from 1941 to 1981, the average number of resolutions fell to only five banks a year. Bank resolutions began to rise again in the 1980s as changes in financial markets, lingering inflation, regulatory reform, and national and regional economic shocks contributed to an environment of structural change for financial institutions.

More than 100 banks had to be resolved every year between 1985 and 1992. The peak year during this period was 1989, when the FDIC resolved 207 banks. In an industry composed of between 11,000 and 12,000 commercial banks, even 200 resolutions in any one year may seem slight--a failure rate of less than 2 percent. But the number of resolutions in any one year is not as significant as the trend over several years. Between 1980 and 1992, the number of commercial banks in the industry shrank by more than 16 percent. This period saw the highest number of resolutions and the first significant challenge to the deposit insurance system in the history of the FDIC.

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7. Kaufman, "Banking Risk in Historical Perspective," pp. 151-164.

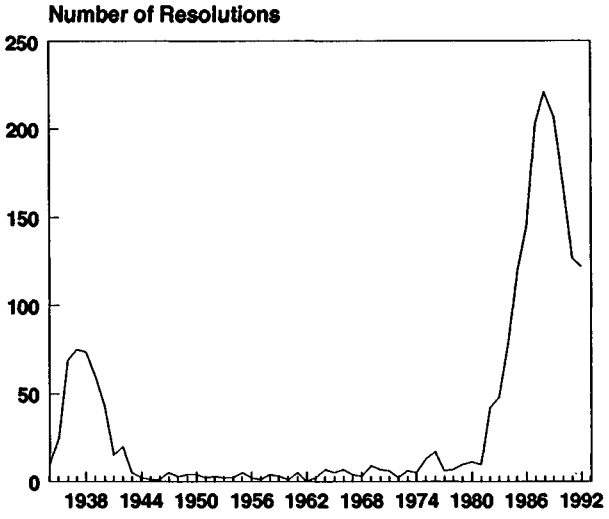
8. George Thorndyke, "Fiction and Fact on Bank Runs," *American Bankers Association Journal* (June 1929), p. 1,269.

9. Kaufman, "Banking Risk in Historical Perspective," p. 152.

10. See Allan H. Meltzer, "Financial Failures and Financial Policies," in George G. Kaufman and Roger C. Kormendi, eds., *Deregulation of Financial Services: Public Policy in Flux* (Cambridge, Mass.: Ballinger Press, 1986). Meltzer states that the Federal Reserve in the role of a lender of last resort should act to prevent illiquid but solvent banks from being forced to close by making loans to them when they face heavy deposit withdrawals.

    See also Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960* (Princeton, N.J.: Princeton University Press, 1963). The authors state that during the 1930s the Federal Reserve did not provide sufficient liquidity, whether through the discount window or open-market operations, and thousands of banks were forced to liquidate their assets simultaneously in depressed markets.

Figure 2.
Number of Bank Resolutions, 1934-1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation.

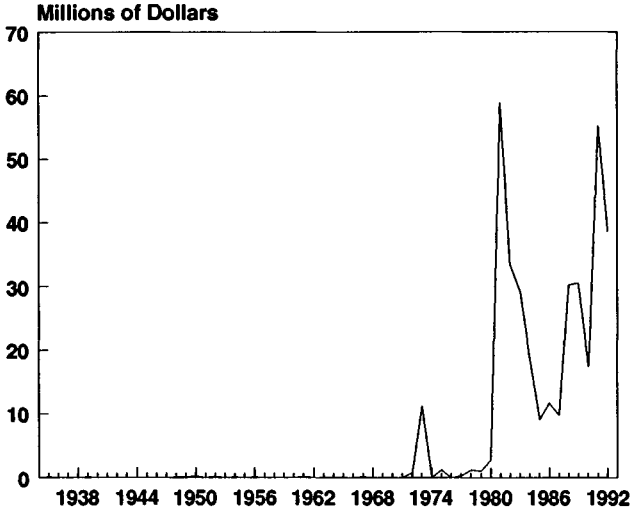
The Impact on the Bank Insurance Fund. The marked increase in resolutions, combined with dramatically higher average losses per institution, resulted in unprecedented losses during the 1980s (see Figures 2 and 3). For 45 years, from 1934 to 1979, the cumulative resolution costs associated with more than 560 failed banks totaled less than $559 million (in 1990 dollars).[11] From 1980 to 1992, cumulative resolution costs for some 1,500 banks exceeded $40 billion.

Not only were a record number of insured banks resolved during the 1980s, but the average size of a bank requiring resolution increased. The assets of all pre-1980 resolutions totaled less than $30 billion (in 1990 dollars), and banks resolved from 1980 to 1992 had assets of almost $330 billion (in 1990 dollars). The average size of a resolved bank in the period before 1980 totaled about $49 million (in 1990 dollars); after 1980, the average resolved bank held about $220 million in assets (in 1990 dollars).

Moreover, losses per dollar of assets increased dramatically for failed banks during the 1980s. In the 1934-1979 period, resolution costs, measured as losses to the fund, averaged about 2 percent of failed bank assets. In the 1980-1992 period, resolution costs per dollar of failed bank assets averaged 12 percent. Had resolution costs per dollar of assets remained at the pre-1980 historical average, losses during the 1980s through 1992 would have been more than 80 percent lower than the losses that actually occurred.

Throughout its history, the FDIC has been able to cover insurance claims with the revenues generated from premium assessments and other sources. In spite of the claims on the fund incurred by the rising number of resolved institutions in the early 1980s, the fund balance was $11 billion in 1980 and actually increased until 1987. In 1988, the second year in a row during which more than 200 banks were resolved, the FDIC suffered an operating loss--the first in the history of the fund--and the re-

Figure 3.
Average Resolution Costs for Resolved Banks, 1934-1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation.

11. FDIC estimates of resolution costs for the 1934-1979 period are obtained from FDIC annual reports. Data were originally compiled in James R. Barth and John J. Feid, "Alternative Federal Deposit Insurance Reprises," Research Paper No. 152 (Federal Home Loan Bank Board, January 1989), but were not adjusted for inflation. This analysis corrects for inflation and uncertainties about the length of time necessary to dispose of assets after liquidation. Resolution cost estimates in this chapter are all in 1990 dollars.

serve ratio was less than 1 percent. The ratio of the insurance fund reserves to total insured deposits is a measure of the overall health of the fund. At the time the law required the FDIC to maintain the insurance fund at a minimum ratio of 1.16 percent. The reserve ratio continued to fall for the next three years and by the end of 1991 the fund had a negative balance.

The Congress enacted special legislation to provide the FDIC with sufficient funds to close insolvent banks and recapitalize the insurance fund. The Federal Deposit Insurance Corporation Improvement Act of 1991 gives the BIF authority to borrow up to $30 billion from the U.S. Treasury to cover the losses from bank resolutions.[12] FDICIA also enables the BIF to borrow additional funds for working capital--up to 90 percent of the value of the assets acquired from failed banks held by the FDIC --from the Federal Financing Bank (also a part of the U.S. Treasury). To recapitalize the BIF, FDICIA requires that the FDIC set assessment rates that will achieve a designated ratio of insurance fund reserves to total insured deposits of 1.25 percent by 2005. A minimum rate of 23 cents per $100 of insured deposits is required until the target ratio is achieved. In January 1993, the FDIC put into effect a "risk-based" premium structure with average premiums of approximately 25 cents per $100 of qualified deposits.

Banking Industry Changes and Consolidation. In one sense, industry analysts view the bank resolutions of the 1980s as the inevitable consequence of an industry undergoing fundamental changes while moving toward greater competitiveness and efficiency. Bank failures, like failures in any other business, can occur as unfortunate by-products of an industry experiencing intensive competition, deregulation, and structural change.

The deregulation of banking began in 1980 with the removal of statutory interest rate caps. Such industries as railroads, trucking, airlines, petroleum, and natural gas experienced consolidation and firm failures following deregulation. So, too, the banking industry underwent a period of consolidation and failures. Less efficient banks fell into insolvency as other banks and nonbank financial institutions competed to serve consumers in financial markets.

The numbers and costs of bank resolutions during the last decade, however, carry more onerous implications than a simple movement toward enhanced efficiency might suggest. The banking sector, despite partial deregulation, still operates under the supervision of state and federal chartering agencies and FDIC regulators. It is therefore important that regulators have an efficient exit policy for insolvent institutions because the longer an insolvent bank is permitted to operate, the greater the potential loss to the insurance fund. By the time regulators declared many failed banks legally insolvent during the 1980s, the value of assets had deteriorated so much that the cost of resolution greatly exceeded administrative costs. A bank is economically insolvent when the market value of its liabilities exceeds the market value of its assets. Without regulatory intervention, an insolvent bank can continue to operate independently until it cannot meet cash obligations; in other words, until insolvency becomes clearly noticeable. The large margin of losses over administrative costs is one indication that these banks had operated in an insolvent state for some time before they were resolved. Empirical analyses of the savings and loan crisis suggest that insolvent institutions that are closed earlier cost less to resolve.[13]

The high resolution costs of the 1980s brought into question the efficiency of regulatory supervision and the process of removing insolvent banks from the system. Regulators depended on traditional book-value methods of accounting that masked potentially insolvent banks until resolution costs became extraordinary. Unanticipated resolu-

12. Section 101 of the Federal Deposit Insurance Corporation Improvement Act of 1991, 12 U.S.C. 1824, 105 Stat. 2236.

13. R. Dan Brumbaugh, Jr., and Robert E. Litan, "A Critique of the Financial Institutions Recovery, Reform and Enforcement Act (FIRREA) of 1989 and the Financial Strength of Commercial Banks," in James Barth and R. Dan Brumbaugh, eds., *The Reform of Federal Deposit Insurance* (New York: Harper Business, 1992). See also Congressional Budget Office, "The Cost of Forbearance During the Thrift Crisis," CBO Staff Memorandum (June 1991).

tions raise fundamental concerns about the ability of regulators to limit future losses. In addition, allowing insolvent banks to continue operating can hurt healthy banks in the same market. Insolvent banks that remain open can increase the cost of doing business as they bid for potential customers.

The Economic Costs of Bank Failures

The primary function of the nation's financial system is to facilitate the efficient allocation of resources in the economy. As an important component of the financial system, banks provide mechanisms for facilitating transactions, transmitting monetary policy, and transferring funds between savers and borrowers--a principal ingredient of economic growth. Banks have been a primary credit conduit, especially for such information-intensive borrowers as small businesses.

The most frequently stated goal of banking regulation is to maintain the safety and soundness (or stability) of the financial system. As an important part of that system, banks provide a vital service to the economy and to society as a whole. Conditions that impede the ability of banks to operate efficiently affect the allocation of resources. If bank closings create a shortage in the amount of credit available, society bears the cost of lost investment opportunities and therefore lower economic growth. Circumstances that affect the stability of banking can also affect monetary policy.

The Direct and Indirect Costs of Bank Resolutions

The cost of bank failures involves more than just the losses that the FDIC reports to the insurance fund. Most failures throw bank employees out of work, causing them at least a temporary loss of full wages. But on the whole, bank resolutions during the last decade did not cause a major loss of jobs in the industry. Bank employment actually increased during most of the decade. Despite the reduction in the number of banks providing financial services, the number of branches did not decrease over the period. It was not until the early 1990s that several institutions started to contract and lay off workers, causing employment in the industry to fall slightly.

There may be, however, substantial indirect losses, particularly in those regions where there are larger numbers of resolved banks. Excessive bank failures in a particular region can temporarily increase the difficulty and costs of obtaining credit for small-to-middle-sized firms in the area. These firms usually depend on banks for commercial and industrial loans. Economic losses associated with bank resolutions can carry over to other industries if creditworthy businesses find it excessively costly to obtain credit as a result of a high rate of bank failures in a region.

In addition to indirect losses suffered by other businesses after bank failures, real economic losses can occur even before a bank fails and is resolved. Most financially weakened banks get that way because they lose money on poor-quality assets--mostly bad loans. For example, excessive investment in commercial real estate throughout the 1980s took the place of other, potentially more valuable, investments. Bad loans, which eventually show up as relatively high losses on an asset, equate to misallocated investment and lower economic growth. Many economists believe that the lack of productivity during the 1980s was, in part, the result of insufficient investment in productive resources. A Congressional Budget Office study of the failures of some 1,000 savings and loans suggests that the opportunity costs of misdirected investment by failed thrifts was substantial.[14]

14. See Congressional Budget Office, *The Economic Effects of the Savings & Loan Crisis* (January 1992).

Chapter Two

The Structural Trends and Economic Conditions Underlying Bank Resolutions

Banks confronted significant changes in the economic and institutional environment in the 1970s and 1980s, contributing to a dramatic increase in the rate of failures. Regulations that were applied just after the Great Depression limited the activities of most depository institutions for more than four decades. Regulators set prices and costs of doing business and limited competition; banks and thrifts usually earned profits and relatively few failed. Banking in those days was a much easier enterprise; markets were insulated and inflation was low.

Two dramatic surges in inflation during the 1970s fundamentally changed the business of banking. One occurred in the mid-1970s as a result of a spike in food and oil prices. The other occurred in 1979 when oil prices surged again as a result of events tied to the revolution in Iran. These two price shocks, combined with an apparently overheating economy, were primarily responsible for the surges in the inflation rate. Both inflationary periods led to dramatic rises in commodity prices, mercurial stock and bond prices, and particularly volatile interest rates.

Interest rate volatility, coupled with advances in information processing, changed bank competition and depositor behavior fundamentally and irreversibly. Volatile inflation raised market interest rates well above regulated interest rate ceilings by the end of the 1970s. As a result, depositors withdrew funds from banks (and thrifts) to invest in instruments that promised to earn a higher rate of return. The draw of double-digit interest rates available on money market mutual funds and Treasury securities made them popular alternatives to banks and thrifts.

Profitability in the banking industry, measured by return on assets, increased moderately during the two decades before 1970.[1] The return on assets started to decline after 1979. Banks entered the 1980s facing a set of structural and economic conditions that had weakened their position in relation to other financial intermediaries both here and abroad. In response to these pressures and the increased rate of bank failures in the latter half of the 1980s, the Congress and state legislators enacted major regulatory changes by the end of the 1980s. Deregulation of depository institutions in the 1980s included a lifting of interest rate ceilings on deposits, an expansion of product lines, and the spread of interstate banking.[2] The regulatory changes were intended to allow banks to compete better with nonbank financial intermediaries. As a result, banks now operate in competitive rather than insulated markets.

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1. Information on bank profitability throughout this chapter comes from the *Federal Reserve Bulletin*.

2. The Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) mandated the phasing out of deposit interest rate ceilings and allowed interest payment on transactions accounts; the Depository Institutions Act of 1982 (Garn-St Germain) allowed interstate mergers between banks and savings and loans; and the Competitive Equality in Banking Act of 1987 (CEBA) limited the growth of so-called nonbank banks.

Enhanced Competition and Financial Innovation

Banks as a group lost ground to open-market credit sources and nondepository financial institutions in terms of funds advanced in U.S. credit markets. Open-market credit increased dramatically during the 1980s, caused by growth in commercial paper and junk bonds. Finance companies led nonbank mediation of credit. Moreover, nondepository financial institutions compete with banks in markets for assets and liabilities. Nonbanks now offer credit cards, residential mortgages, consumer and commercial loans, and transaction accounts. By 1990, subsidiaries of such retailers as Sears Roebuck and such manufacturers as the Ford Motor Company and General Electric were financing one-third of consumer credit and one-quarter of commercial loans.[3]

Although the assets of the financial services industry (including banks) have continued to grow, the share of domestic financial assets held by U.S. commercial and savings banks decreased from about 50 percent in 1950 to 22 percent in 1991. Over the same period, pension and mutual funds grew from about 5 percent to 30 percent of financial assets. Assets held by finance companies doubled during this period, accounting for 7 percent of assets in 1991. Other depositories, life insurance firms, and nondepository institutions, including automobile companies, retail department stores, and telephone companies, make up the remaining share of assets.[4]

Increased competition and financial innovation made banking less stable in the 1980s. Continuing advances in computer technology, which increase the speed and volume of information processing, have helped to popularize new kinds of financial assets, especially off-balance-sheet instruments. Enhanced technology also facilitated the development of an increasingly international market for financial assets. Each day, global banking transactions amount to more than $1 trillion. International competition continues to threaten the domestic banking industry's ability to vie for both deposits and assets. Many of the resulting changes in financial markets directly contributed to falling revenues from interest income.

The Changing Composition of Bank Balance Sheets

The composition of bank liabilities has changed drastically since the 1970s (see Figure 4). The trend shows a decline in checkable deposits (mostly demand deposits and NOW accounts) in favor of interest-bearing liabilities. Two of the more popular forms of liabilities are certificates of deposit and money market instruments. Demand for both of these financial instruments is sensitive to movements in the market interest rate. Now, when short-term market rates move adversely, depositors respond by shifting their investments to the financial instrument with the highest return. Banks are forced to offer competitive returns to keep customers. The increased competition puts a downward pressure on interest income and increasingly exposes banks to liquidity risk.[5]

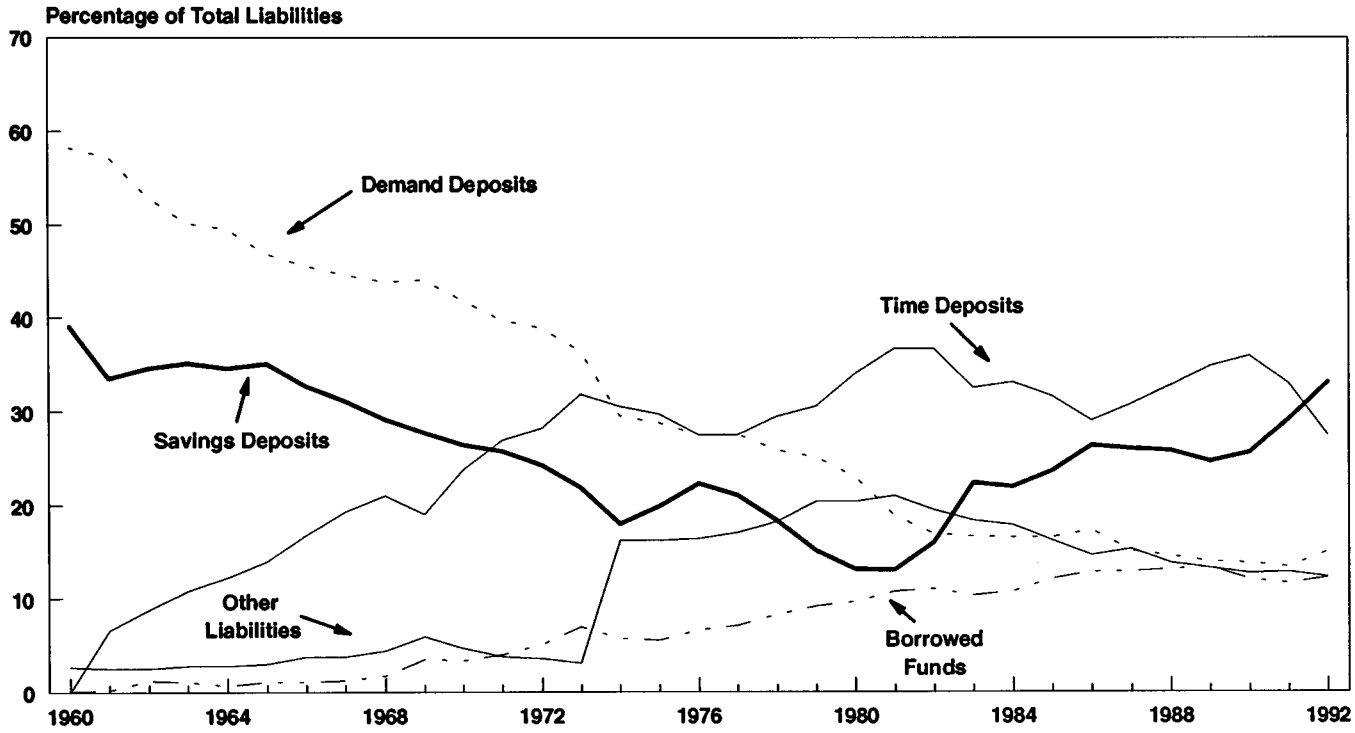
As the effects of inflation eroded the value of long-term loans, liquidity became important. Aided by improvements in data processing, the phenomenon of securitization of finance became a popular means for banks to increase their liquidity in the late 1980s. Many banks sought to turn away from a strictly buy-and-hold management strategy in which they collect funds from customers, then invest them in financial assets held until maturity. Securitization involves the pooling of a large number of individual loans into bundles that can be sold as some form of security on secondary markets. Loans for securitization have fairly uniform features, are usually well collateralized, and do not require a high level of

3. See Roger Vaughan and Edward Hill, *Banking on the Brink* (Washington, D.C.: Washington Post Company, 1992), p. 19.

4. Herbert L. Baer and Larry R. Mote, *The U.S. Financial System* (Chicago: Federal Reserve Bank, December 1990). See also Robert E. Litan, "The Revolution in U.S. Finance: Past, Present and Future" (paper presented as a Frank M. Engle lecture, The American College, Bryn Mawr, Pa., April 30, 1991).

5. James Barth, R. Dan Brumbaugh, Jr., and Robert E. Litan, *The Future of American Banking* (New York: M.E. Sharpe, Inc., 1992), p. 63.

Figure 4.
Composition of Commercial and Savings Bank Liabilities, 1960-1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation, *FDIC Historical Statistics on Banking, 1934-1992* (September 1993).

NOTE: Demand deposits are all deposits subject to withdrawal on demand (checking); savings deposits include all savings deposits; time deposits are all time certificates of deposit, time open accounts, and similar deposits; borrowed funds are federal funds, treasuries, mortgage indebtedness, and other liabilities for borrowed money.

of monitoring--for example, residential mortgages, automobile loans, and credit card balances.

With securitization, banks could better match the term structure of assets, transform loans to a more liquid type of asset, and eliminate some of the asset portfolio risk associated with liquidity. Banks now have the flexibility to sell financial assets to other investors if they need to shrink their asset base (and thereby increase the capital-to-asset ratio) to comply with capital standards or change strategy if operating needs or economic conditions dictate it.

Ultimately, in an increasingly competitive market, interest rates on loans become lower as the market begins to reflect reduced risk in the pricing of securitized assets.[6] Deeper secondary markets for the formerly illiquid loans caused interest rates to decline on these loans and thereby lowered interest income. As a result, securitization may have helped banks cope with the events of the 1970s and 1980s, but over the longer term it may have also eroded bank profit margins.[7] Bank profitability in the latter half of the 1980s was significantly below its average for most of the 1970s.

The composition of banking's loan portfolio changed dramatically from the mid-1970s through the 1980s (see Figure 5).[8] The major categories of bank loans include commercial and industrial loans,

6. Barth, Brumbaugh, and Litan, *The Future of American Banking*, p. 63.

7. Ibid., p. 64.

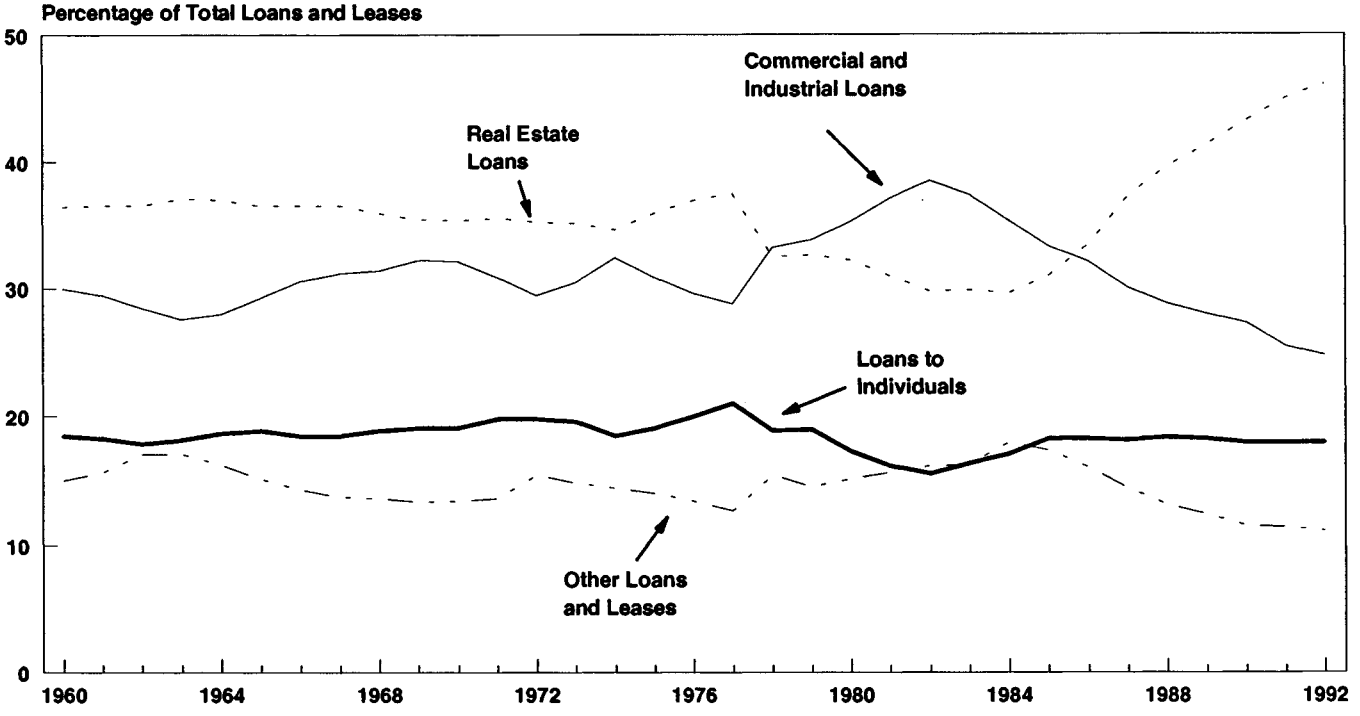
8. Information on the change in the composition of bank assets comes from Barth, Brumbaugh, and Litan, *The Future of American Banking*; and John H. Boyd and Mark Gertler, "U.S. Commercial Banking: Trends, Cycles, and Policy," Working Paper No. 4404 (National Bureau of Economic Research, Cambridge, Mass., July 1993).

mortgages, and consumer credit. Commercial and industrial loans decreased during the 1980s from 21 percent to 19 percent of assets. The fall in commercial and industrial loans was caused in part by domestic competition (discussed above) and loans to U.S. firms by foreign banks. The rise in these offshore loans in the 1980s reveals the increased importance of foreign banks to commercial lending in the United States.

With the loss in share of commercial and industrial loans came a rise in the relative importance of mortgage lending from the mid-1970s through the 1980s. Banks picked up some business from savings and loans, but the shift to mortgages had already begun by the time these mortgages became available. Mortgage loans include construction and development loans as well as commercial and residential mortgages. Real estate loans increased from 15 percent to 23 percent of assets during the 1980s. The increased concentration in real estate loans exposed banks to fluctuations in the real estate market, causing the banking industry additional problems. The increase in commercial mortgages accounts for much of the growth in mortgage lending for banks in the 1980s. Although this was true for commercial banks, it was not true in general. Many of the asset problems associated with bank failures in later periods came from bad commercial mortgages (notably in Texas).

Total loans and leases grew from 55 percent to 62 percent of assets during the 1980s. Loans tend to be less liquid than securities and thus, as the

Figure 5.
Composition of Commercial and Savings Bank Loans and Leases, 1960-1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation, *FDIC Historical Statistics on Banking, 1934-1992* (September 1993).

NOTE: Real estate loans include all loans secured by real estate such as single and multifamily mortgages, farmland mortgages, and mortgages or liens on business and industrial properties. Commercial and industrial loans include all loans and commercial paper for commercial or industrial purposes. Loans to individuals include all loans for auto financing, home improvement, and personal expenses.

share of these assets increases, they increase the exposure of a portfolio to liquidity risk. The ratio of loan losses to total industry loans has been rising since 1960. Loan losses decreased moderately in 1992, but the ratio of loan losses is still high compared with periods before 1960. During the 1980s banks also reduced liquidity as cash, and cash due from other depositories, fell by one-half from 18 percent of assets in 1980 to 9 percent in 1990.

Incentives for Increased Risk in Investments

Corporate borrowers had long been the mainstays of commercial bank lending and provided a good source of income. Banks typically charged these borrowers 100 basis points (1 percentage point) over the cost of funds. Blue-chip corporations with superior credit ratings soon found that uninsured investment banks could provide them with access to the commercial paper market--borrowers could attend to their short-term credit needs through corporate bonds. As a result, corporate bonds increased dramatically during the 1970s. By the end of the 1970s, corporations had obtained $124 billion through debt financing. In addition, investment banks gave corporate borrowers more access to commercial paper. They began to offer borrowers medium-term notes and other sources of credit, as well as making available to firms the ability to insure against large changes in equity value.

Rapid gains in telecommunications and computers helped blue-chip borrowers seek credit elsewhere. During the 1980s, the volume of commercial paper tripled. Between 1960 and 1989, the proportion of nonbank commercial paper issued by commercial firms grew from 10 percent to more than 75 percent. Banks had little choice but to consider alternative types of assets to replace the lost business.

As many of the high-quality assets moved off bank balance sheets, banks were left with fewer low-risk customers. Moreover, bank profit margins were challenged on both the asset and liability sides of the balance sheet through increases in interest expenses and downward pressures on interest income. These challenges to bank operations moved banks to pursue riskier management strategies in an effort to augment returns.[9] Before partial deregulation in the 1980s, regulations limited the incentive and ability of banks to pursue excessively high-risk activities. When regulations relaxed, it became increasingly important that regulators monitor bank safety, soundness, and risk and supervise banks that posed a risk of loss to the Bank Insurance Fund.

Usually, if investors anticipate that the returns on an investment will vary, they will not lend unless the expected return is high enough to compensate for the risk. It has long been recognized, however, that a fixed-rate deposit insurance system can pose a moral hazard by encouraging excessive risk taking.[10] Banks had an extra incentive to increase returns through riskier instruments since, in effect, any increase in risk was subsidized by the deposit guarantee system. The deposit insurance system subsidized risk taking by banks because during this period insurance premiums were unrelated to risk of failure. (The Federal Deposit Insurance Corporation Improvement Act of 1991 mandates that insurance premium rates take into account the risk of loss to the insurance fund.)

Evidence of Increased Risks Associated with Returns to Banks

Investment risk is defined as potential variation in expected returns to the investor. The variance (a statistical measure of variation) of both the return on assets and return on equity of banks increased throughout the 1980s, indicating the increased riskiness associated with bank capital. The popular perception that the 1980s were marked by a dramatic increase in banking risks is reinforced by an exami-

9. See Frederick T. Furlong and Michael C. Keeley, "Capital Regulation and Bank Risk-Taking: A Note," *Journal of Banking and Finance* (November 1989), pp. 883-891.

10. See Michael C. Keeley, "Deposit Insurance, Risk and Market Power in Banking," *American Economic Review* (December 1990), pp. 1183-1200. Keeley concludes that the recent increase in bank failures can be attributed to a rise in competition (resulting from deregulation), causing franchise value to decline and creating an incentive for increased risk taking.

nation of the total variance of bank stock returns.[11] From 1979 to 1990, the average return on bank stocks of a sample of 84 large bank holding companies fell in relation to a sample of nonfinancial stocks and government bonds; at the same time, the variance of stock returns increased.

Many banks began to seek returns in this competitive and fast-moving environment from what proved to be not only risky but ill-advised investments. At a time when competition was escalating, large banks, hit hardest by the loss of blue-chip customers, may have been tempted to pursue riskier forms of investment. The evidence shows that nonperforming loans constituted about 2 percent of assets for the largest banks (banks with assets greater than $10 billion) through 1985 and rose to 2.5 percent on average for the last half of the decade. By contrast, banks with assets of less than $100 billion had 1.5 percent of their assets invested in nonperforming loans, falling to 1 percent by 1990. Two examples of investments that caused significant losses--primarily for big banks with the technology and access to these markets--were loans to developing countries and junk bonds.[12]

Debt in Developing Countries. Mexico, Brazil, Chile, Argentina, and other developing countries borrowed tens of billions of dollars from U.S. banks to finance social programs and oil imports in the 1970s. These loans were fueled in part by the large amount of money placed in international banks by oil-exporting countries after the oil-price rises in the 1970s.[13] U.S. banks required little or no collateral for these loans. Many were based on tenuous assumptions about economic growth in developing countries and as a gesture of international cooperation.

Banks clearly misread the borrowers' ability to repay. As time passed, the burden of debt repayment as a percentage of national income climbed steadily. In the early 1980s, U.S. banks began to lend more funds to these countries in an effort to salvage what would have been a guaranteed default. In 1982, Mexico, Brazil, and Argentina demanded rescheduling of their payments. By the mid-1980s, developing countries owed foreign investors approximately $400 billion. U.S. money center banks --those holding more than $10 billion in assets with access to international markets--held about $50 billion of Third-World debt. In 1987, at the request of bank regulators, U.S. banks wrote off as losses about $40 billion in loans to developing countries. Compensation for these debt losses was especially noticeable because the return on assets for the banking industry fell from 0.61 percent in 1986 to 0.09 percent in 1987. By the early 1990s, the debt burden for many developing countries had been eased through debt restructuring, thereby reducing the problem for U.S. banks.

Junk Bonds. So-called "junk" bonds are high-yielding but low-rated corporate debt securities. These bonds carry ratings of BB or lower, because they are judged to be of above-average default risk. In the 1980s, many companies issued them to finance corporate acquisitions or to repay debt obligations. Banks traditionally played an important role in the financing of leveraged buyouts (LBOs) because client information gave them an advantage.[14] By requiring access to a client's cash flow and an adequate valuation of assets, traditional investments in LBOs were less risky than those that took place during the 1980s. Commercial credit companies willing to take greater risks by allowing lower credit standards began to compete very successfully with banks. Equity yields of 35 percent to 50 percent and subordinated debt yields of 25 percent to 40 percent were not uncommon for these investments in the early 1980s. With such high returns available, this financial instrument grew enormously. In fact, the volume of junk bonds grew from $1.6 billion to more than $300 billion before the collapse of the junk bond market in 1989.

11. Jonathan A. Neuberger, "Bank Stock Risk and Return," *Federal Reserve Bank of San Francisco Weekly Letter*, no. 91-38 (November 1, 1991).

12. See Vaughan and Hill, *Banking on the Brink*, p. 33.

13. David S. Holland, "The Bank and Thrift Crises--A Retrospective," *FDIC Banking Review*, vol. 6, no. 1 (Spring/Summer 1993).

14. Traditionally, banks had an advantage over virtually all other intermediaries in information-intensive lending.

Banks fueled this expansion by encouraging high interest rates and fees that amounted to 1 percent or 2 percent of principal. Concerns about creditworthiness began to erode. Loan officers found that they could more than double their banks' earnings by concentrating on LBOs rather than lending to investment-grade (more creditworthy) firms.[15] The subsequent downturn in this market imposed heavy losses on banks participating in these deals.

The Growth of Off-Balance-Sheet Activities: A Significant Sectoral Trend

The business of banking has changed considerably over the last two decades. An increasing amount of the business done by banks does not show up as either assets or liabilities--that is, it is not recorded on balance sheets. In fact, many of the traditional activities of commercial banking have moved off the balance sheet. For example, a standby letter of credit is a financial instrument in which a bank guarantees a loan made by some third party, rather than funding the loan with depositor funds. Even though the loan does not appear on the asset side of the bank's balance sheet, the risk of loss is virtually the same as if it did.

Other examples of major off-balance-sheet activities include securitization (discussed above), loan commitments, and the rapidly growing category of derivative instruments (primarily swaps and options). Banks use loan commitments essentially like a line of credit to fund planned investments. Firms anticipating needs for funds will arrange for a loan commitment. Derivative instruments involve the trading (swapping) of risks. A common example of a derivative security is an interest rate swap in which two parties exchange sequences of interest payments. A foreign exchange contract involving the exchange of a sequence of interest payments among different currencies is another derivative instrument. Option contracts give the purchaser the right to buy or sell a specified amount of a financial asset at a particular price on or before a future date of expiration.

In 1989, off-balance-sheet items accounted for approximately four times the volume of balance-sheet items.[16] Income from off-balance-sheet activities (fee income) as a percentage of total income before operating costs grew from 20 percent in 1979 to 33 percent in 1991. Despite having a decreased share of industry assets on their balance sheets, banks remain important for originating information-intensive lending. Commercial banks remain involved (directly or indirectly) in the lending of short-term working capital and therefore continue to provide an important service to businesses.[17]

Some regulators have expressed particular concern about the risk exposure of commercial banks operating in the market for derivative instruments.[18] These markets are largely unregulated, and as they evolve and technology advances, new types of securities continue to be developed at a rapid pace. There is also uneasiness that activity in derivatives is concentrated among a small group of very large commercial banks. Substantial losses on trading in derivatives could force a large bank into insolvency, which could affect derivatives markets unfavorably and perhaps damage money and exchange rate markets as well.[19] The data on derivative instruments are still preliminary and several agencies are evaluating these concerns.[20]

In addition to the recent structural changes in the financial sector and the incentives to increase returns by investing in riskier ventures, a series of adverse economic events put more stress on the financial system. Not only did interest rates rise sharply and the junk bond market collapse in the 1980s, but the economy underwent periods of recession, rapid inflation and deflation of energy prices,

15. Vaughan and Hill, *Banking on the Brink.*

16. Eileen Maloney and George Gregorash, "Banking 1989: Not Quite a Twice Told Tale," *Economic Perspectives*, Federal Reserve Bank of Chicago (July-August 1990).

17. Boyd and Gertler, "U.S. Commercial Banking."

18. E. Gerald Corrigan, "The Risk of a Financial Crisis," in Martin Feldstein, ed., *The Risk of Economic Crisis* (Chicago: University of Chicago Press, 1991), pp. 44-53.

19. Boyd and Gertler, "U.S. Commercial Banking," pp. 12-14.

20. General Accounting Office, *Financial Derivatives: Actions Needed to Protect the Financial System* (May 18, 1994).

and a stock market "break." Banks tied to regional markets suffered from declines in agriculture, energy, and real estate.

Macroeconomic Conditions, Regional Disparities, and Asset Losses

General economic conditions affect the financial condition of bank customers and therefore influence bank profitability. The 1970s and 1980s share similar business cycle patterns. Both decades began with modest recessions that grew more serious and were followed by booms. The similarities in terms of lost production and unemployment are striking. But the recession of the 1980s was marked by more severe regional dislocations than that of the 1970s. Some macroeconomists have characterized the economic environment of the 1980s as one big rolling regional recession hitting different geographic areas at different times over the decade. Lost steel production in the early 1980s preceded the oil and farm sector problems of the middle 1980s, which preceded the economic problems in New England and California in the late 1980s.

There were periods in the 1980s when the value of the dollar was high in relation to other currencies, export trade suffered, and industries such as agriculture, which rely heavily on exports, declined. During these periods, foreign competition increased against some of the more labor-intensive industries in which lower labor costs gave foreign firms a comparative advantage. In addition, changes in world prices affected the demand for the products of some important domestic industries. For example, the steel and energy industries were hit by a price-induced decline in consumer demand for those goods.

Regional Variation in Bank Failure

During the 1987-1992 period, the FDIC resolved some 7 percent of those banks in existence at the beginning of 1987, or 1,049 in all (see Table 1). Analysis reveals a strong regional pattern of higher-than-average bank resolutions associated with regions experiencing temporary economic difficulties. The Southwestern states, principally the oil state of Texas, accounted for 60 percent of the resolutions over the six-year period. The majority of these 631 resolutions occurred between 1987 and 1990, around the period when oil and real estate prices collapsed in this region. The Northeast region, accounting for about 13 percent of resolutions (132 banks) is a distant second in the number of failures. Most of the resolutions in this region occurred between 1990 and 1992 and were associated with the downturn in the real estate sector in the New England states. The West and Midwest regions combine to account for about 20 percent of resolved institutions (119 and 97 banks, respectively) over the period. These regions contain a high proportion of agricultural states. During the mid-1980s, the agriculture sector experienced a downturn that contributed to bank failures in subsequent years.

Comparing the national average of resolutions with the incidence by region, the Southwest showed a disproportionately large number of resolutions and assets held by resolved banks. In the Southwest, 20 percent of the banks in the region had to be resolved between 1987 and 1992. These resolved institutions held 32 percent of the industry assets in place at the beginning of 1987. The only other region that was significantly higher than the national average in both categories was the Northeast. It is therefore not surprising that these two regions dominated the number and costs of resolutions during this period. The Southwest and Northeast bank resolutions (631 and 132 banks, respectively) combined to account for 73 percent of the number of resolutions and about 90 percent of the losses to the Bank Insurance Fund for the 1987-1992 period.

Texas: A Special Case. There is clearly substantial interstate variation in bank failure and resolution experiences. Two states escaped without any failures between 1987 and 1992. Another 13 states experienced only one or two bank resolutions.[21] By

21. Federal Deposit Insurance Corporation, Division of Finance, Financial Reporting Branch, *Failed Bank Cost Analysis, 1986-1992* (1993).

Table 1.
Resolutions by the Federal Deposit Insurance Corporation, by Region, 1987-1992

	Number of Resolutions	Number of Banks in the Industry, December 31, 1986	Incidence of Resolution (Percent)	Assets of Resolved Banks as a Percentage of Industry Assets, December 31, 1986	Resolution Losses to the Bank Insurance Fund (Billions of dollars)
Northeast[a]	132	1,538	8.6	8.3	12.2
Southeast[b]	46	1,956	2.4	4.3	0.8
Central[c]	24	3,126	0.8	0.2	0.1
Midwest[d]	97	3,315	2.9	1.8	0.8
Southwest[e]	631	3,137	20.1	32.0	14.3
West[f]	119	1,588	7.5	1.5	1.5
Total	1,049	14,660	7.2[g]	7.5[g]	29.6

SOURCE: Congressional Budget Office using data from the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTE: The regions in this table are categorized by the Federal Deposit Insurance Corporation.

a. Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Puerto Rico, Rhode Island, Vermont, and Washington, D.C.

b. Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

c. Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin.

d. Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

e. Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

f. Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

g. Numbers are averages.

contrast, the state of Texas alone accounted for more than 50 percent of resolutions during this period. Texas banks were hit particularly hard by sectoral declines in the local oil and gas market and subsequent declines in local real estate markets. A decade of structural change in the financial services industry, combined with oil-price collapses in 1982 and 1986 and a decline of real estate in the Southwest during the 1985-1989 period, put considerable pressure on Texas banks.

Regulatory supervision showed little ability to control real estate loans by Texas banks during this period. And the fact that the frequency of examination in Texas declined during a critical period (1985-1986) made the situation worse. Despite increasing commercial and industrial vacancy rates from the early to mid-1980s, Texas banks continued to increase commercial and industrial real estate loans before 1987.[22] These banks were overexposed to what turned out to be a severe decline in the real estate market.

Asset Quality Influenced by Regional Downturns in Industries

Bankers have traditionally managed risks by rejecting those that were too costly or by diversifying portfolios to compensate for them. In the aftermath of deregulation bankers were free to price risk as

22. John O'Keefe, "The Texas Banking Crisis: Causes and Consequences, 1980-1989," *FDIC Banking Review*, vol. 3, no. 2 (Winter 1990), pp. 1-34.

they saw fit--through interest rates charged to borrowers and paid to depositors. But increased competition left banks with razor-thin profit margins and a limited ability to raise prices as a way of compensating for risk.

The economic shocks of the 1980s and the early 1990s jeopardized banks that violated some of the basic principles of risk management. These institutions typically held portfolios that were inadequately diversified and composed of loans that were poorly priced; loan officers granted loans to less creditworthy customers. Managers who increase the risk of a portfolio by concentrating assets lose more if those sectors of the economy upon which it concentrates experience a downturn. Real estate and energy-related investment are two primary examples of assets in which banks in various regions became overexposed.

Real Estate Investment. For most of the 1970s and early 1980s, real estate investment appeared to be a perfect hedge against inflation. The stock and bond markets were crippled by inflation in the 1970s. Commodity prices and exchange rates fluctuated, but real estate held its value, increasing steadily over the 1973-1974 period of inflation and well into the 1980s. Banks acted accordingly, diverting larger portions of their portfolios to real-estate-based assets.

In the early 1980s, federal tax legislation contributed to the upswing in real estate by giving the real estate industry deep tax subsidies. In particular, the Economic Recovery Tax Act of 1981 offered large depreciation deductions for commercial real estate. The prevailing high interest rates created both large passive losses and a booming tax shelter to partnership investors in real estate. Passive losses meant that investors could profitably syndicate losses through shell corporations to people with tax liabilities.

The tax subsidies that stimulated the demand for real estate investment, along with the Garn-St Germain Depository Institutions Act of 1982, allowed banks to invest more of their portfolios in real estate. The act eliminated margin limits on real estate lending. Banks and savings and loans rushed to fill the resulting demand for construction. Banks began offering debt financing with little equity. They even began to pay closing costs to attract customers.

After the recession in early 1981 and 1982, the demand for commercial space did not materialize as expected. The vacancy rate for office buildings in 31 major markets rose from 5 percent in 1980 to about 14 percent in 1983.[23] Some banks continued to exercise little caution, real estate lending continued, and credit standards began to erode. In the three years after passage of the Garn-St Germain Act, Texas commercial banks tripled their construction and land development loans. But the heavy investment in commercial real estate was not confined to Texas banks.

After partial deregulation of the industry in the early 1980s, bankers across the country invested some $350 billion in commercial real estate lending that produced 32 percent of all the existing office space in America during the 1980s. Developers were not required to demonstrate firm leases for commercial real estate development. Savings and loans, a growing competitor of banks for both loans and deposits, became willing to act as real estate equity investors through their real estate service corporations. Appraisers continued to overvalue real estate investments, justifying continued bank lending.

By 1986, vacancy rates in downtown office markets exceeded 16 percent.[24] The Tax Reform Act of 1986 reversed generous tax depreciation allowances, increased capital gains tax rates, and restricted passive loss deductions. It became evident that the real estate boom was ending. Projects once economically viable, if only as tax shelters, became losses. By 1988, nine of the top 10 banks in Texas, all exhibiting portfolios with heavy concentrations of real estate holdings, required FDIC resolution. Commercial real estate investments began to decline as excess capacity became more prominent in New England, New York, and Califor-

23. Holland, "The Bank and Thrift Crises."

24. Patric Hendershott and Edward Kane, "Office Market Values During the Past Decade: How Distributed Have Appraisals Been?" Working Paper No. 4128 (National Bureau of Economic Research, Cambridge, Mass., July 1992).

nia. Real estate loans in these areas of the country became nonperforming and eventually the default rate on them contributed to a number of bank failures. Developers with high vacancy rates declared bankruptcy and bankers had little choice but to accept vacant and semivacant properties. By 1991, the nationwide vacancy rate for commercial office space had reached 20 percent.

At the beginning of the 1980s, real estate loans made up 25 percent of the banking industry's loan portfolio. By the end of the decade, real estate constituted 43 percent of the loan portfolios of surviving banks and an even greater portion of the loan portfolios of failed banks. Surviving banks held more than $1 trillion of their assets in real estate. By the end of 1991, banks were carrying $90 billion in nonperforming real estate loans, 75 percent of which were held by 57 bank holding companies. Conservative estimates made in 1992 suggest that excess capacity in real estate sales may take 5 to 10 years to work off.[25] Economic losses associated with this overbuilding could cost $220 billion to $300 billion.

In retrospect, it is clear that some banks underpriced loans and real estate investments as they sought to increase asset volume and compete with savings and loans. Many of these banks subsequently failed. A former chairman of the FDIC, testifying before the Senate Banking Committee in 1992, suggested that "we wouldn't have a problem if banks had been prevented from lending on raw land, forbidden to make commercial real estate loans without the borrower putting up 25 percent, and required to get personal guarantees from borrowers. Those were ironclad rules 20 years ago."[26]

Energy Investment. Real estate problems, like inflation, were linked to the twin energy crises of the 1970s. The oil shortages produced a surge of economic development and growth in the Southwest. Oil companies with proven reserves undertook a flurry of domestic exploration. Banks began to finance mineral leases, exploration, and construction of corporate headquarters in the Southwest. Loans were backed by oil prices at $40 per barrel. In 1981, however, oil prices began to slide. By the mid-1980s, oil fell to $20 a barrel. When energy prices began to decline in the middle 1980s, so did the Southwest's economy. Banks that invested heavily in the oil fields of the Southwest suffered enormous losses. A significant percentage of the banks resolved in the Southwest between 1987 and 1992 were located in the oil-producing states of Texas, Oklahoma, and Louisiana.

25. Hendershott and Kane, "Office Market Values During the Past Decade," p. 69.

26. Statement of William Seidman before the Senate Banking Committee, March 31, 1992.

Chapter Three

The Role of Management and Institution-Specific Factors Associated with Resolutions

Bank resolutions in the late 1980s and early 1990s followed or coincided with periods of serious economic decline and structural change in financial markets. It is easy to attribute the rash of bank resolutions in the 1980s entirely to adverse economic conditions, and the presumption is reinforced by the inordinately large number of failures in particular geographic regions. But virtually all banks underwent the adverse economic conditions and enhanced competition that troubled the 1970s and early 1980s. A majority weathered these circumstances and some even prospered. Analyses of surviving and resolved banks reveal that under almost identical circumstances, management generally plays an important role in determining why one bank survives and another fails.

Ultimately, a bank's management and board of directors and their cumulative decisions are responsible for the success or failure of the institution. Although regulators play a role in shaping the environment in which banks must operate, they cannot claim primary responsibility for the success or failure of a bank.

Management and Bank Failure

A study of banks that were resolved during the 1980s identifies major causes of bank failures by using data from examiners' reports that specifically characterize the quality of managers and boards of directors before resolution. The study contains proprietary data that are generally available only to analysts within banking regulatory agencies.[1] These data include information prepared by bank examiners of the Office of the Comptroller of the Currency (OCC) about the financial status of banks.

The sample used in the study includes 171 resolved banks and represents 94 percent of the resolutions of national banks from 1979 through 1987. In addition to resolutions, the study examines 51 rehabilitated banks--that is, national banks that recovered from a weakened financial state. The locations, external problems, and asset sizes of the rehabilitated banks are similar to those of the resolved banks in the sample and therefore provide a relevant comparison of resolved banks to weakened banks that survived. This study also compares the two groups of rehabilitated and resolved banks to a control group of 28 banks that remained healthy during the period.

The study found that so-called management-driven weaknesses played a "significant role" in the

1. F. Graham and J. Horner, "Bank Failure: An Evaluation of the Factors Contributing to the Failure of National Banks," *Bank Structure and Competition: Proceedings from the Federal Reserve Bank of Chicago* (1988). Studies testing similar hypotheses using more recent data are not available.

   See also Gary Gorton and Richard Rosen, "Corporate Control, Portfolio Choice and the Decline of Banking," Finance and Economics Discussion Series No. 215 (Board of Governors of the Federal Reserve System, 1992). This study focuses on managerial entrenchment problems contributing to a decline in banks.

decline of 90 percent of the resolved and problem banks in the sample (see Table 2). These results do not imply that 90 percent of bank losses can be attributed to management problems, nor does it mean that different management could have averted 90 percent of bank failures. But in 90 percent of the cases, examiners thought that deficient management, acting in conjunction with other factors, contributed to bank failure. With more effective management, many of these banks could probably have avoided some losses before they badly deteriorated.

Table 2.
The Incidence of Five Areas of Weakness That Figured Prominently in the Decline of National Banks Between 1979 and 1987

Areas of Weakness	Percentage of Total Resolved Banks	Percentage of Rehabilitated Banks (Before recovery)
Policy, Planning, and Management Quality	90	88
Audits, Controls, and Systems	24	24
Asset Quality[a]	98	98
Insider Fraud and Abuse	36	24
Economic Environment	35	39

SOURCE: F. Graham and J. Horner, "Bank Failure: An Evaluation of the Factors Contributing to the Failure of National Banks," *Bank Structure and Competition: Proceedings from the Federal Reserve Board of Chicago* (1988).

NOTE: About 73 percent of failed banks operated under depressed economic conditions, compared with 50 percent of healthy banks in the sample. But 67 percent of rehabilitated banks operated in depressed local economies after recovery.

a. Asset quality is not independent of management quality.

Although the external causes of bank failure, such as inflation, recession, competition, and volatile interest rates, affected virtually all banks (73 percent of national banks resolved during the 1979-1987 period operated in economically depressed areas), OCC examiners blamed banks' problems on "external economic conditions" in the cases of only 35 percent of those banks that were resolved.[2] But these results must be interpreted cautiously. It is not possible to separate "external economic conditions" neatly from problems of asset quality. These findings for individual bank resolutions are based on subjective evaluations by examiners who set out to list a group of factors contributing to the failure of a particular bank. Even with the most sophisticated techniques, distinguishing between management quality and the economic environment in which banks operate is obviously difficult; the categories are not mutually exclusive.

Ironically, a greater percentage of the rehabilitated banks--39 percent--experienced significant weakness in their economic environment than did the resolved banks; still, these banks recovered (see Table 2). Before they recovered, rehabilitated banks suffered problems similar to those of failed banks. For example, 88 percent of the rehabilitated survivors (compared with 90 percent of failed banks) exhibited significant weaknesses in management policies and controls. About 98 percent of both failed banks and those that were later rehabilitated showed poor asset quality during initial examinations. What dictated resolution or rehabilitation? It cannot be shown conclusively with these data, but it is worth noting that 93 percent of the resolved banks also had significant management problems and that 63 percent had problems with their chief executive officers. By comparison, rehabilitated banks had significant management problems in less than 50 percent of the instances reported, and fewer than 39 percent of the banks had CEO problems.[3] Moreover, when examiners discovered a financially weakened bank that had a chief executive officer who lacked ability or integrity, 90 percent of the rehabilitated banks replaced that CEO. By contrast,

2. Graham and Horner, "Bank Failure: An Evaluation of the Factors Contributing to the Failure of National Banks."

3. Ibid., p. 406.

Table 3.
Internal Management Factors Contributing to the Failure of National Banks Resolved Between 1979 and 1987

Management Factors	Percentage of Resolved Banks with Management Problems
Nonexistent or Poorly Followed Loan Policies	81
Inadequate Systems to Ensure Compliance with Internal Policies or Banking Laws	69
Inadequate Controls or Supervision of Key Bank Officers or Departments	63
Inadequate Systems to Identify Problem Loans	59
Poor Decisions Made by One Dominant Individual	57
Nonexistent or Poorly Followed Asset and Liability Management Policies	49
Inappropriate Lending Policies	86
Excessive Loan Growth	51
Undue Reliance on Volatile Liabilities	41
Problems Related to Internal Oversight or Management Deficiencies (Accounting inadequacies such as missing financial statements or income information, and so on)	81
Overlending in Relation to Debt-Service Ability of Borrower	72
Collateral-Based Lending and Insufficient Cash Flow Analysis	53
Unwarranted Concentrations of Credit Given to Single Industry	36

SOURCE: F. Graham and J. Horner, "Bank Failure: An Evaluation of the Factors Contributing to the Failure of National Banks," *Bank Structure and Competition: Proceedings from the Federal Reserve Board of Chicago* (1988).

76 percent of those banks that were ultimately resolved did not.[4]

Bank examiners also listed insider fraud and abuse as contributing to the decline of banks in more than one-third of those institutions that they evaluated during the 1979-1987 period (see Table 2). Fraud and abuse problems were linked to a lack of oversight and controls. Another study that examined a sample of 218 resolutions during the 1985-1987 period found fraud and insider abuse in 25 percent of the bank failures.[5] Many of the resolutions from 1987 to 1990 are characterized by excessive asset growth in illiquid assets (notably real estate) several years before failure. Such asset growth is ultimately the result of aggressive loan policies established or condoned by management.

4. Ibid., p. 414.

5. John F. Bovenzi and Arthur J. Murton, "Resolution Costs of Bank Failure," *FDIC Banking Review*, vol. 1, no. 1 (Fall 1988), pp. 1-13.

The major management problems that regulatory examiners listed as directly contributing to the failure of national banks under their supervision between 1979 and 1987 are inefficient handling of loans--including inadequate loan policies, systems to identify problem loans, and systems to ensure compliance with bank policy and law--and deficiencies in accounting (see Table 3).

A Comparison of Resolved and Surviving Banks

The confluence of economic events greatly increased the difficulties that management faced during the 1980s. Some managers reacted poorly to a barrage of unusual situations. Those who adjusted to the rapidly changing market avoided failure and even prospered. The mix of assets in a bank portfolio is one indicator of the way managers reacted to the pressures created by these external factors. In order to investigate the differences between surviving banks and those that have been resolved, the Congressional Budget Office (CBO) compared the behavior of a cohort of similarly sized banks several years before failure. This type of comparison indicates how managers behaved differently, but the available data do not allow for isolating specific factors that caused managers to behave in a certain way.

Because time-series data on market value are not available for most banks, comparing resolved banks with surviving banks is possible only by comparing book-value measures of key financial variables (equity-to-asset ratios, and so on). A comparison of this sort is nevertheless instructive, because even on a book-value basis the two groups have distinguishing characteristics that point to fundamental differences between typical surviving and resolved banks.

The sample for this analysis is composed of small banks with assets of less than $25 million. Banks of this size make up the highest proportion of resolutions among all asset groups during the latter half of the 1980s. For the sake of comparison, the record of these resolved institutions is contrasted with that of similarly sized banks that survived dur-

Table 4.
A Comparison of Portfolio Characteristics of Small Resolved and Surviving Banks, 1987-1989 (In percent)

	Banks Open December 31, 1990	Banks Resolved in 1990
Real Estate Loans as a Share of Total Loans		
1987	39.2	35.9
1988	40.5	37.4
1989	41.3	38.1
Commercial and Industrial Loans as a Share of Total Loans[a]		
1987	18.7	28.7
1988	17.8	27.1
1989	17.2	27.3
Other Loans as a Share of Total Loans[a]		
1987	42.1	35.7
1988	36.7	35.5
1989	41.5	34.6
Securities as a Share of Assets[a]		
1987	30.8	13.4
1988	30.9	15.1
1989	29.5	13.6
Total Loans as a Share of Assets[a]		
1987	47.8	62.8
1988	49.2	61.3
1989	50.1	60.2
Memorandum:		
Sample Size	3,795	60

SOURCE: Congressional Budget Office analysis based on data from the Federal Deposit Insurance Corporation (FDIC) and W.C. Ferguson and Company.

NOTES: Averages are computed among all firms in each sample. Data on failed banks for 1990 indicate data recorded by the FDIC at time of failure and are limited to only a few variables. All percentages are based on end-of-year data.

Sample includes insured banks with the following characteristics:

- o Open and operating by end of 1987
- o 1987 assets less than $25 million at end of 1987
- o Still open in 1990 or resolved in 1990
- o Consistent data series for 1987 through 1989

a. Percentages are significantly different (at the 5 percent level) using analysis of variance (ANOVA) statistical tests.

ing the 1987-1990 period. Historical data on financial characteristics are compared for institutions with assets of less than $25 million at the beginning of 1987 that either remained open through the end of 1990 or were closed in that year.

Management of Portfolio Risk

The riskiness of a portfolio depends on two characteristics--the size of shares in it and how the returns on shares vary. For example, if a bank portfolio is composed of only two types of assets and if the returns on both forms of assets move in the same direction under similar market conditions, they could be volatile (more risky). In this case, the returns on both assets (composing the entire portfolio) will move up or down concurrently. If, instead, the return on one form of asset parallels general economic conditions and the return on the other asset moves inversely with the economy, the returns of the two will be less volatile and hence less risky. Portfolio risk is reduced because changes in the returns offset each other.

The size of asset shares in a portfolio is also important. The larger the share of one type of asset, the more exposed is the whole portfolio to changes in market conditions that affect that type of asset. The rule is simple: to reduce risk, diversify the asset portfolio. Carrying out the rule, however, is an art--it requires training, practice, and instinct.

Differences in the portfolios of the two groups generate two types of comparisons: how the mean portfolio characteristics of the two groups compare, and how these means changed over time--between 1987 and 1989. CBO used a simple analysis of variance (ANOVA) procedure to test whether the means calculated for the surviving banks are significantly different from those of resolved banks for each variable in each year observed (see Table 4). The share of real estate loans as a percentage of total loans is not statistically different from 1987 to 1989, but shares of commercial loans and securities test significantly different in each year.

Although book-value measures are only an approximate measure of market value, a number of the portfolio characteristics appear to distinguish the two groups as early as three years before the resolu-

Table 5.
Assets, Capitalization, and Profitability: A Comparison of Historical Characteristics of Small Resolved and Surviving Banks, 1987-1989

	Banks Open December 31, 1990	Banks Resolved in 1990
Assets and Equity (Thousands of dollars)		
Assets in		
1987	15,105	16,021
1988	16,656	16,629
1989	18,051[a]	15,359[a]
1990	19,660[a]	14,541[a]
Equity in		
1987	1,497[a]	1,136[a]
1988	1,576[a]	788[a]
1989	1,668[a]	125[a]
Capitalization (Percent)[a]		
Equity as a Share of Assets in		
1987	12.0	7.5
1988	10.2	4.8
1989	9.9	0.6
Profitability (Percent)[a]		
Net Income as a Share of Assets in		
1987	0.41	-1.96
1988	0.56	-2.36
Memorandum:		
Sample Size	3,795	60

SOURCE: Congressional Budget Office analysis based on data from the Federal Deposit Insurance Corporation (FDIC) and W.C. Ferguson and Company.

NOTES: Averages are computed among all firms in each sample. Data on failed banks for 1990 indicate data recorded by the FDIC at time of failure and are limited to only a few variables. All figures use end-of-year data.

Sample includes insured banks with the following characteristics:

- o Open and operating by end of 1987
- o 1987 assets less than $25 million at end of 1987
- o Still open in 1990 or resolved in 1990
- o Consistent data series for 1987 through 1989

a. Figures are significantly different (at the 5 percent level) using analysis of variance (ANOVA) statistical tests. Tests indicate whether the means of the distributions of open and resolved banks are statistically different in each year.

tion of a failed bank (see Table 4). Resolved banks held more than 60 percent of their assets in loans, a relatively illiquid form of asset. Survivors held 50 percent or less of their assets in loans, thereby maintaining greater flexibility in their portfolios to handle temporary problems with liquidity. Banks that were resolved not only held a larger share of loans in their asset portfolio, but also held lower asset shares of securities than banks that survived the period. Consequently, surviving banks were more diversified and exposed to less overall risk.

Paradoxically, real estate loans as a percentage of total loans were slightly higher (although not significantly so) for surviving banks than for resolved banks (see Table 4). Further investigation of the data, however, reveals that failed banks in Texas, for example, held a higher percentage of real estate loans (particularly commercial real estate) than surviving banks. Commercial mortgages are generally regarded as more risky than residential mortgages. Moreover, real estate loans were not equally risky in all regions. Small surviving banks as a group increased real estate loans and decreased commercial loans as a percentage of loans over the period as long as these types of loans continued to accrue.

Asset Growth and Profitability

The average equity-to-asset ratio for the small banks that were resolved in 1990 was well above capital adequacy requirements only three years before resolution (see Table 5). By comparison, the average equity-to-asset ratio for banks that survived through 1990 was 60 percent higher in 1987 (12 percent) than for institutions in the sample that were resolved by the FDIC. Both failing and surviving banks experienced an annual decline in equity-to-asset ratios over the 1987-1990 period. But the drop in capitalization for the failed banks was precipitous, a result that is not peculiar to this sample of resolved banks; other studies show a similar pattern of decay for different cohorts of failed banks.[6]

6. See George E. French, "Early Corrective Action for Troubled Banks," *FDIC Banking Review*, vol. 4, no. 2 (Fall 1991), pp. 1-12.

Because equity-to-asset values are expressed in book-value terms, the rapid decay apparent in book-value equity-to-asset ratios may not indicate the true rate of decline in market value for small banks that were resolved in 1990. In fact, the initial market-value ratio of these banks may have been lower than recorded book values in 1987. It is possible that many of the small banks that ultimately failed and were resolved in 1990 could not overcome the

Table 6.
Assets and Capitalization: A Comparison of Annual Growth Rates of Small Resolved and Surviving Banks, 1987-1989 (In percent)

Growth Characteristics	Annual Growth Rate[a] Banks Open December 31, 1990	Banks Resolved in 1990
Assets in		
1987-1988	12.2	5.0
1988-1989	7.8	-6.9
Equity in		
1987-1988	7.2	-30.4
1988-1989	7.1	-91.0
Equity as a Share of Assets in[b]		
1987-1988	-14.6	-36.6
1988-1989	-3.0	-87.0
Memorandum:		
Sample Size	3,795	60

SOURCE: Congressional Budget Office analysis based on data from the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTE: Sample includes insured banks with the following characteristics:

- o Open and operating by end of 1987
- o 1987 assets less than $25 million at end of 1987
- o Still open in 1990 or resolved in 1990
- o Consistent data series for 1987 through 1989.

a. Figures are significantly different (at the 5 percent level) using analysis of variance (ANOVA) statistical tests. Tests indicate whether the means of the distributions of open and resolved banks are statistically different in each year. All figures use end-of-year data.

b. The rate of growth calculated using the weighted average of equity-to-asset ratios. All other averages are computed among all firms in each sample.

embedded losses that they incurred before 1987. Without market data on individual banks, there is no clear way to determine which event best describes reality. Data indicate that these banks were suffering income losses as early as 1987, when the average return on assets was a negative 2 percent (see Table 5). Moreover, for the next two years the average return on assets for the institutions resolved in 1990 remained negative.

It is also possible that losses may not have been entirely embedded. Although earnings were suffering, the average equity-to-asset ratio in the group was 7.5 percent in 1987. One year later, the average equity-to-asset ratio was less than 5 percent. Generally, weakly capitalized banks attempt to increase capital ratios by increasing income or reducing assets. At least initially, the banks destined for resolution in 1990 apparently did not opt to reduce assets; the average growth in assets between 1987 and 1988 was 5 percent (see Table 6). By 1989, however, the small banks that were destined to fail and be resolved in 1990 experienced a large decline in the value of assets. In some cases, banks may have sold profitable assets to improve capitalization. It is also very likely that as examiners began to recognize problems, they forced these banks to write down some of their bad assets as a loss. Assets of the average small bank that was resolved in 1990 declined from more than $16.6 million in 1988 to $14.5 million by the time of resolution.

In this sample, the average bank that was resolved in 1990 displayed losses in net income for at least three consecutive years before resolution. The average equity of small banks resolved in 1990 declined by 30 percent between 1987 and 1988 and by more than 90 percent from 1988 to 1989. Equity grew at an average annual rate of 7 percent for banks that survived the period. Losses in net income and significant reductions in equity clearly indicate that the average small bank that was resolved in 1990 was in serious financial difficulty at least three years before resolution. Although some asset reduction began as early as two years before failure, it was not sufficient to raise equity-to-asset ratios or circumvent the income losses that eventually took place in resolved banks.

Some institutions were able to recover from a position of being poorly capitalized. The recovery of a bank from a status of undercapitalization depends upon the institution's capability to generate profits, reduce assets, and issue external equity.

Do Weakly Capitalized Banks Recover?

In 1985, federal banking regulators established a minimum primary capital-to-asset ratio of 5.5 percent for all commercial banks. Primary capital can be thought of as actual equity available to absorb losses in case of failure. It consists of common equity, perpetual preferred stock, and minority interest in equity accounts of consolidated subsidiaries (it does not include goodwill).

A 1990 study shows that the number of banks that fell below a primary capital ratio of 5.5 percent almost tripled between 1985 and 1988, and as many as 455 banks fell below the minimum equity-to-asset ratio at the end of 1988.[7] From 1981 to 1988, capital-to-asset ratios of about 1,500 banks fell below 5.5 percent. About 45 percent of these banks recovered fully, their capital-to-asset ratios exceeding 5.5 percent. Some 36 percent were resolved and the remaining 19 percent remained weakly capitalized. The 1990 study tests the hypothesis that the likelihood and speed of recovery are not affected by near-term earnings, nor are they influenced by the ability to raise capital by issuing external equity. The study rejects this hypothesis and concludes that banks that have positive earnings and can raise capital usually do not require resolution.

Another study published in 1991 examines a group of commercial banks, the primary capital ratios of which remained less than 5.5 percent for more than four consecutive quarters between 1985 and 1989.[8] This study shows that only 24 percent of the banks that remained undercapitalized for

7. M. Spivey and D. Dahl, "An Examination of the Efforts of Commercial Banks to Recover from Undercapitalization" (paper presented at the annual meeting of the Financial Management Association, Orlando, Florida, 1990).

8. R. Alton Gilbert, "Supervision of Undercapitalized Banks: Is There a Case for Change?" in Federal Reserve Bank of Chicago, *Rebuilding Banking: Proceedings of the 27th Annual Conference on Bank Structure and Competition, May 1-3, 1991*, pp. 335-357.

more than a year were able to increase their capital ratio sufficiently to recover by the end of 1989. The study also adds an important regional insight. The ability to recover from weak capitalization was much greater for banks outside those energy-producing states that were experiencing a decline at the time. In this study, only 10 percent of the banks in Louisiana, Texas, and Oklahoma were able to recover, although the recovery rate was 46 percent for banks located outside this region.

The Effectiveness of Early Closure. The Federal Deposit Insurance Corporation Improvement Act of 1991 authorizes the FDIC to resolve banks that dip below tangible equity-to-asset ratios of 2 percent measured as book value. One way to assess the potential effectiveness of a rigidly imposed early closure rule is to examine the record of failure and recovery of banks whose equity-to-asset ratios fell below 2 percent. Of the 235 banks in the industry that dropped below equity-to-asset ratios of 2 percent at the end of 1988, only 36 banks, or 15 percent, were still operating as of June 30, 1991.

The financial characteristics of these 36 surviving banks indicate that those that recovered from below the threshold of 2 percent equity were relatively small, holding less than $80 million in assets. Only one of these institutions held assets greater than $500 million. A prominent characteristic of the survivors was the ability to raise capital. Total equity for the group was only $31 million by the end of 1988. By June 1991, surviving banks had increased their equity more than fourfold, to $152 million. The average surviving bank was able to raise $3.9 million in two and one-half years. Equity-to-asset ratios for the average bank increased from 1 percent by the end of 1988 to 5 percent by June 1991.

These banks added equity largely by issuing new common stock and selling bank-held stock at above-par value. Book-value accounting conventions value stock at par value unless the stock is sold. If the market value of stock exceeds par value, selling the stock will raise additional equity. Issues of new common stock amounted to about $21 million, and the amount received from the sale of old common stock in excess of par or stated value amounted to $79 million.

Chapter Four

Bank Resolutions and the Costs of Resolution

During the 1980s, regulators faced not only an increase in the number of bank failures requiring resolution, but an increase in the average cost of resolving a bank. For the first 46 years of the Bank Insurance Fund, resolution costs, measured as losses to the fund, averaged about 2 percent of failed bank assets. The ratio of resolution costs to bank assets increased to 8 percent in the early 1980s and to about 17 percent between 1986 and 1990. Resolution costs as a percentage of failed bank assets dropped to 11 percent in 1991 and 1992, down from an average of more than 20 percent in 1987 and 1989, the peak years of the period.

The cost to the insurance fund of resolving a bank depends on the value of liabilities covered by deposit insurance and the value of assets that can be recovered during the resolution process. Covered liabilities include mostly insured deposits; uninsured deposits may also be handled by the Federal Deposit Insurance Corporation, depending on the kind of resolution transaction. The loss on assets--the difference between the book value of assets at the time of resolution and the net value that can be recovered if the assets are sold--is a major determinant of the cost of resolution. As the recoverable value of assets after resolution decreases, the cost of resolving an institution increases. The average loss on assets for resolved banks in the late 1980s was about 30 percent.[1] The cost of resolving banks during this period severely depleted the insurance fund. As the drain on the insurance fund continued, recognition of bank insolvency and a timely exit policy for insolvent institutions became a critical part of regulatory efficiency.

Resolution Costs as Estimates of BIF Losses

Although banks must answer to different chartering and supervisory regulators at the state and federal level, each of which is charged with maintaining the safety and soundness of the banking system, only the FDIC has the responsibility of selecting a method of resolution that limits costs to the insurance fund. Methods for resolving banks can be divided into three general categories: payoffs and transfers, including liquidations; purchase and assumptions or various types of mergers; and assistance transactions to ongoing institutions, such as open-bank assistance.[2] (See Appendix B for a detailed discussion of the categories of resolution.)

The choice of a method of resolution is governed in large part by the FDIC's estimates of the potential costs to the insurance fund. The FDIC is required by law to perform a cost test for proposed methods of resolution. Before the Federal Deposit Insurance Corporation Improvement Act of 1991,

1. Richard A. Brown and Seth Epstein, "Resolution Costs and Bank Failures: An Update of the FDIC Historical Loss Model," *FDIC Banking Review*, vol. 5, no. 1 (Spring/Summer 1992), pp. 1-16.

2. Open-bank assistance includes all forms of financial assistance between the FDIC and an ongoing bank.

the cost test required only that the chosen method of resolution be no more costly to the insurance fund than a payout of insured depositors and liquidation of assets (payout and liquidation), which would be required to meet the FDIC's insurance obligation. Using this rule, the FDIC could select any feasible method of resolution as long as the cost test was satisfied. Under FDICIA, the FDIC is now required to consider all possible methods of resolution and choose the least costly alternative. Usually the FDIC estimates the cost of payout and liquidation as a base case and compares it with costs of alternative methods of resolution. The same techniques are used to calculate estimated costs for various methods of resolution, but the new rule changes the way in which the costs are compared.

Upon selecting the method of resolution, the FDIC provides an initial estimate of the resolution cost based on the experience of the FDIC staff in resolving many other failed banks. The estimate is not that of the full cost borne by all parties in the transaction, but an estimate of the loss to the BIF. That is, it is an initial estimate of how much the insurance fund will lose after the FDIC completes the resolution of the bank and the disposition of its assets. Estimates of losses require, at a minimum, that the FDIC appraise the market value of the assets and liabilities of the failed institution.

Insurance Costs and Methods of Resolution

Resolution cost estimates represent the present value of losses to the insurance fund and can be measured by an accounting identity that includes market-value assessments of the liabilities and assets and the administrative costs of resolution.[3] The basic accounting identity is:

Resolution Cost = Realized Liabilities - Realized Value of Assets + Administrative Costs

The magnitude of this measure of cost depends on how *liabilities* are defined and the *realized value of assets* assessed. These terms mean different things for different types of resolutions.

The way in which uninsured deposits are treated affects the size of realized liabilities. Realized liabilities in a liquidation by the FDIC may be limited to insured deposits; if the bank is acquired by another institution, however, realized liabilities could include a much broader set of liabilities. Different methods of resolution can be characterized by whether or not uninsured depositors are protected. In some resolution transactions, uninsured depositors must absorb their proportionate share of losses resulting from the closing of the failed bank. Common examples of resolutions in which uninsured depositors are not protected include insured deposit transfers and payouts. In other resolution methods, usually in the case of assumption transactions, uninsured deposits are protected against loss resulting from bank failure.[4]

Aside from the treatment of uninsured deposits, the treatment of assets can significantly affect the cost to the BIF of resolving a bank. In the case of a liquidation, the realized value of assets is simply the value recovered for assets after disposal. In the case of a merger, the total realized value of assets may also include a value for such intangibles as goodwill; that is, the franchise value of the ongoing entity that the acquirer is willing to pay to obtain the institution. Each method of resolution may handle failed-bank assets in as many as three ways. One way is to assign them to a receivership--the entity that discharges the legal obligation of a resolved institution. In this case the FDIC, as receiver, is responsible for collecting and disposing of these assets. Another way of handling assets is that some portion (or all) of the assets of a resolved bank may be assumed by the acquirer. In the third way, failed-bank assets are subject to a collecting pool or loss-sharing agreement. These assets are managed and collected by the acquirer on behalf of the FDIC. The acquirer generally receives management fees and in some cases enters into a loss-shar-

3. For this type of assessment, assets and liabilities include on- and off-balance-sheet activities.

4. In an effort to comply better with the least-cost test imposed by FDICIA, in 1992 the FDIC deviated from the traditional use of purchase and assumption in which all deposits are usually assumed by the acquiring institution. The new method of resolution is similar to the traditional purchase and assumption except that only insured deposits are transferred to the acquirer.

ing agreement with the FDIC. In an effort to reduce losses to the BIF, the FDIC attempts to keep failed bank assets under private control whenever feasible.

In practice, resolution costs are the difference between the initial disbursements that the FDIC makes to resolve a failed bank and the present value of the amount that the FDIC expects to recover on assets.[5] Whether liabilities are transferred or involved in a payout, it is easy to see that the amount the FDIC is able to recover on assets of the failed bank to offset handling the liabilities is significant in determining the cost of resolution. Estimates of resolution costs are based on forward-looking procedures that include the length of time it will take to dispose of the assets of failed banks. Disposition of assets may take seven years or more depending on the type of resolution and the type of asset.[6] The FDIC generates initial estimates of expected recoveries (and thereby, estimates of realized asset value) for each type of asset at the time of resolution and periodically updates these estimates until the asset is fully recovered or written off.[7]

Resolution Costs and Regulatory Effectiveness

If banks are resolved on the basis of market value when they first become insolvent--that is, when liabilities are just greater than the market value of assets--losses to the fund can be held roughly to the administrative costs required to process the resolution through the FDIC system. Most banks were closed when they became book-value insolvent--that is, when the book value of equity dropped to zero. Two FDIC studies found that the average loss on assets for resolved banks between 1985 and 1989 was about 30 percent.[8] These results imply that the market value of assets to the FDIC was only about 70 cents per dollar of recorded book value by the time the resolution process began. Had the banks' problems been detected when the market value of assets was equal to liabilities and promptly resolved, perhaps some of the loss on assets could have been avoided.

One possible measure of the effectiveness of the overall regulatory process is the extent to which resolution costs exceed administrative costs. For purposes of analysis, *embedded losses* are defined as the amount of resolution costs above the costs that can be attributed to administrative expenses. Although administrative expenses are not reported separately by the FDIC in its estimates of total resolution costs, some industry analysts estimate that the administrative costs for small-to-moderate-sized banks during the 1980s were between 4 percent and 10 percent of assets.[9] Using the higher figure of 10 percent, it is possible to generate a conservative estimate of embedded losses per dollar of assets at resolution. For the 1987-1992 period, approximately 80 percent of bank resolutions cost more than 10 cents per dollar of assets and therefore (using the above definition) had embedded losses. Roughly 28 percent of the resolutions in this period had costs per dollar of assets that exceeded 30 percent of assets, and more than 3 percent of these resolutions had costs that exceeded 50 percent of assets (see Figure 6). Data on earlier resolutions indicate that for the period between 1934 and 1979, total

5. The FDIC shares the proceeds of the sale of assets with other creditors. Its share is determined by the amount of the insured liabilities in relation to total liabilities of the bank at resolution.

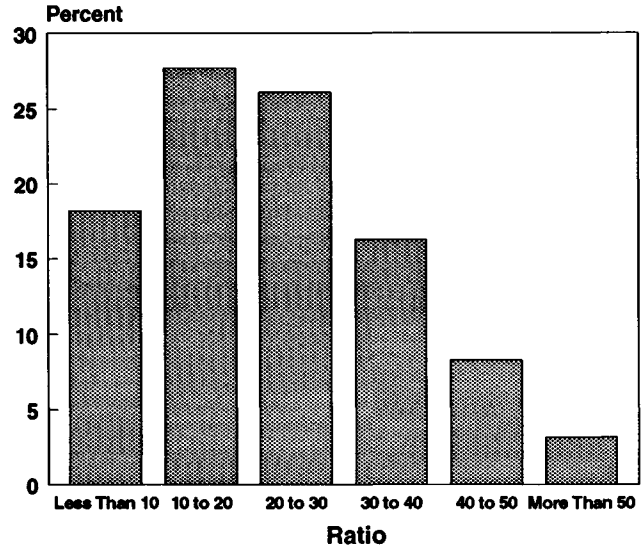
6. Brown and Epstein, "Resolution Costs and Bank Failures," pp. 1-16. This study presents data on the time distribution of asset recoveries for receiverships begun from 1986 through 1990. The data show that for such assets as securities and installment loans, most recoveries are made within one year of the receivership. Recoveries on commercial loans and mortgages tend to proceed less quickly.

7. Currently there is only one study that compares initial estimates of loss on assets with realized values manifested after resolution. See Brown and Epstein, "Resolution Costs and Bank Failures," pp. 1-16. This kind of information could be used to validate market-value formulas used at resolution.

8. See John F. Bovenzi and Arthur J. Murton, "Resolution Costs of Bank Failure," *FDIC Banking Review*, vol. 1, no. 1 (Fall 1988), pp. 1-13; and Brown and Epstein, "Resolution Costs and Bank Failures," pp. 1-16.

9. Christopher James, "The Costs of Resolving Bank Failures," *Journal of Finance* (September 1991), estimates that administrative costs average between 8 percent and 10 percent of failed bank assets. Conversations with George French, Associate Director of the Research and Statistics Division at the FDIC, in April 1992 corroborate James's findings. James Thompson, Assistant Vice President of the Federal Reserve Bank of Cleveland, disagrees with this figure and suggests that administrative costs are closer to 4 percent of assets.

Figure 6.
Distribution of Resolved Banks Grouped by Ratios of Resolution Costs to Bank Assets, 1987-1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation.

resolution costs per dollar of assets exceeded 10 percent only five times. By contrast, total losses per dollar of resolved bank assets between 1980 and 1992 exceeded 10 percent in every year except for two.[10]

The fact that losses were on average higher in the 1980s than they were in the previous period may indicate diminished regulatory effectiveness. It is likely that two factors could have contributed to diminished effectiveness. First, examiners may not have been able to identify potential failures early enough to permit regulators to avoid additional losses because of the uncertainties involved in identifying insolvency and the overwhelming number of banks that failed over a short period. Second, examiners may have identified severely undercapitalized banks, but either practiced forbearance or were unable to elicit compliance through supervision.

10. See Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis: 1985-1990* (1992); and Federal Deposit Insurance Corporation, *1992 Annual Report* (1993).

Resolution Costs and Early Detection

From the inception of deposit insurance, it was commonly accepted that bank examination--monitoring the financial condition of banks--and supervision and oversight could prevent bank failures (see Box 1). In an industry of more than 14,000 banks in which fewer than 12 banks failed each year over a period of 46 years, there was no evidence to the contrary.

By 1973, however, financial analysts began to change their attitudes toward bank examination. They argued that examinations should be aimed only at detecting insolvency and protecting the insurance fund against losses, not at preventing bank failures.[11] One study in 1980 argued that, "The appropriate purpose of bank examination, then, is the detection of insolvency, so that a bank can be closed before its losses exceed the amount of its capital."[12] Subsequent analysis of bank failures during the 1980s reveals that losses often exceeded capital for resolved banks. It is hard to know the degree to which insolvent banks escaped detection or regulators detected severe problems but refrained from closure until banks were clearly insolvent.

Problems Determining Economic Viability. For unregulated businesses, market-value insolvency occurs when a firm is unable to meet its financial obligations. Creditors issue lawsuits and bankruptcy petitions are filed. The court appoints a conservator to oversee either restructuring or liquidation. Insolvency is legally defined in this context and is measurable (at least after the fact). It is more difficult to determine insolvency in a regulated industry in which firms are declared insolvent by a regulator. In fact, in some instances, regulators are clearly motivated to keep an insolvent institution operating, and in some cases, they have no choice. This became obvious during the height of the thrift crisis when insolvent institutions were allowed to remain open, partly because there were no funds available

11. George Benston, "Bank Examination," Reprint Series No. C-16, (Center for Research in Government Policy and Business, University of Rochester, Rochester, N.Y., 1973).

12. Paul Horvitz, "A Reconsideration of the Role of Bank Examination," *Journal of Money, Credit, and Banking*, vol. 12, no. 4 (1980), p. 656.

to resolve them. At the same time, however, some savings and loans had themselves declared insolvent by the courts.

In economic terms, insolvency occurs only when the market value of liabilities exceeds the market value of assets; that is, when the firm is no longer economically functional. Put another way, insolvency occurs when a firm's expected discounted revenue stream is negative for the indeterminate future. Unfortunately, there is no universally accepted procedure for determining the market value of assets and liabilities for a bank without selling the assets in the market. This lack of a procedure makes an economic assessment of the market valuation of assets disputable and subject to many assumptions. The standard system of book-value accounting, based on value at the last transaction, can hide the true value of assets. An insolvency test based on book-value accounting can be misleading because it may disguise an insolvent institution as book-value solvent.

Box 1.
The Basics of Bank Regulation and Examination

State or federal chartering agencies regulate banks from the time they apply for a charter until they close and their last deposits are transferred or repaid. Both federal and state government agencies control entry into the industry, as well as the location and operation of banks. A state chartering agency or comptroller of the currency can charter a bank. When assessing a new charter, the regulatory authority considers such things as the initial capital position of the bank, a community's need for a bank, and the bank's potential for success, given the economy in which it will operate. In exercising their chartering responsibilities, the comptroller and state banking commissioner regulate both entry and exit.

Commensurate with their chartering responsibilities for operating a safe and sound banking system, regulatory agencies monitor bank operations by reviewing detailed financial statements that all banks must file quarterly. Examiners conduct on-site audits and examinations. The criteria for safety and soundness require monitoring to identify financially weak institutions. By law there are overlapping jurisdictions between federal and state regulatory authorities. Regulators adhere to the following breakdown of responsibilities for bank examinations:

- Comptroller--all national banks;
- Federal Reserve--state-chartered banks that are members of the Federal Reserve;
- Federal Deposit Insurance Corporation--state-chartered banks that are not members of the Federal Reserve; and
- State agencies--all state-chartered banks.

Bank examiners consider a bank's financial condition, review its compliance with laws and regulations, and study its prospects for the future. Examiners try to identify emerging financial problems by checking capital adequacy (C), asset quality (A), management practices (M), earnings (E), and liquidity (L). The so-called CAMEL rating is a numerical index (from 1 to 5) based on an examiner's assessment of these categories and is used to identify problem banks that may require supervisory action. Bank examiners assign an index of 4 or 5 to banks that they regard as operating under unsatisfactory conditions. Examiners report to regulators who may demand that institutions increase capital, alter current loan policies, or increase loan loss reserves to cover loans that are highly likely to default. Regulators may remove management if necessary and ultimately force resolution.

Once examiners and regulators determine that a bank has problems, regulators act jointly with the institution to eliminate the need for resolution or request a timely resolution. During the 1980s, before the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), the appropriate state chartering agency or the Office of the Comptroller of the Currency would authorize the Federal Deposit Insurance Corporation to resolve a failed bank. The FDIC could petition the chartering agency to request a resolution, but this was a time-consuming process. With the advent of FDICIA, the FDIC may now initiate resolution procedures.

Although examiners can usually judge which banks are financially distressed, determining when a bank first becomes insolvent is very difficult. The process of classifying a bank as economically incapable of surviving before it reaches book-value insolvency is fraught with uncertainty. Regulators can make two kinds of errors in classifying a bank as insolvent: they may classify a bank that is really functional as insolvent. Conversely, they may classify a bank that is really insolvent as functional.

In the history of the insurance fund, the two errors have not been equally important. Since 1934, regulators have rarely resolved a bank that was solvent by book-value measures. During the 1980s, regulators usually preferred to err on the side of leaving a financially distressed bank operating rather than close a functional bank. The costs associated with behaving as if a bank is functional when it is not can appear eventually as embedded costs that show up as relatively high resolution costs per dollar of assets. The costs of the first type of error--classifying a bank as inoperable when it was not--would be associated with litigation and other costs of premature closing. In the 1987-1991 period, only one institution--the Southeast Bank of Florida--was closed before it was book-value insolvent.[13] The costs of resolving Southeast Bank proved to be minimal--only 3 percent of tangible assets (see Appendix A, which discusses methods of evaluating the financial condition of banks).

During the 1980s, regulators faced legal and economic pressures to avoid closing a bank before it became book-value insolvent.[14] To close such institutions meant that the regulators would have had to endure immediate vocal disapproval from those directly affected--owners of banks, boards of directors, local communities, and their representatives. Beneficiaries of timely closures were conspicuously silent and typically unaware of the costs of regulatory delay.[15] Not surprisingly, regulators were hesitant to close banks before they became book-value insolvent. In most cases, it appears that regulators preferred to wait until "the death rattle was clearly audible."[16]

The evidence suggests that examiners and regulators during the 1980s may have been genuinely uncertain about whether the banking problems stemmed simply from temporary liquidity troubles or more substantial difficulties related to economic insolvency. Even after a resolution, examiners can only estimate the extent of embedded losses and are often unable to pinpoint when the losses first occurred. Most of failed bank losses are associated with bad loans, but when did the loans become "bad"? Were these loans poor to begin with, or did bad loans only become bad when they became nonperforming? Looking back, it is clear that banks priced the loans poorly, required insufficient collateral, and neglected to diversify risk adequately. Before actual failure, however, the book-value accounting method did not serve regulators well because they did not see what was coming until it was too late.

Approximately 13 percent of the banks that failed from 1987 to 1992 had equity-to-asset ratios exceeding 6 percent at the end of the year before they were resolved (see Figure 7). These banks were reasonably capitalized by book-value measures. Regulators were most likely surprised when a significant percentage of the these seemingly well-capitalized banks failed. In the 1985-1991 period, the FDIC resolved about 140 banks that examiners had rated at the beginning of the year as being in good condition--as either a CAMEL 1, 2, or 3 (see Box 1).[17] The FDIC clearly had not expected these

13. Southeast Bank was resolved September 19, 1991. The estimated loss was $350 million. Data supplied by Jeff Taylor of the FDIC, January 10, 1992.

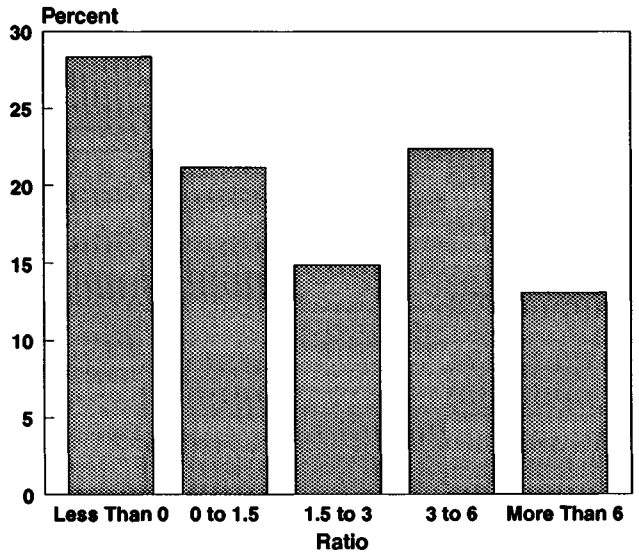
14. Federal Deposit Insurance Corporation, *Deposit Insurance for the Nineties: Meeting the Challenge* (1989).

15. James R. Barth, Philip F. Bartholomew, and Carol Labich, "Moral Hazard and the Thrift Crisis: An Analysis of 1988 Resolutions," Research Paper 150 (Federal Home Loan Bank Board, May 1989); and Congressional Budget Office, "The Cost of Forbearance During the Thrift Crisis," CBO Staff Memorandum (June 1991).

16. L.J. Davis, "The Problem with Banks? Bankers: Bad Loans, Not Bad Laws, Created the Current Crisis," *Harpers* (June 1991), pp. 45-53.

17. CBO is grateful for data supplied by George French, Associate Director, Division of Research and Statistics, FDIC. Data on CAMEL ratings are not available for individual institutions. Only summary data on CAMEL ratings are provided by the FDIC.

Figure 7.
Distribution of Resolved Banks Grouped by Equity-to-Asset Ratios, Observed at the End of Year Before Resolution, 1987-1992



SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation.

institutions to require resolution. Even among banks designated as "problem" banks by the FDIC, there are different expectations of failure based on the designated CAMEL rating. Institutions rated as CAMEL 4 are not expected to fail with as high a likelihood as those with a CAMEL rating of 5.

Examiners Were Overwhelmed. In addition to the problems that regulators may have been uncertain about when institutions became insolvent, regulators may simply have been overwhelmed by the events of the 1980s. In the context of new financial instruments and the greater latitude afforded banks by deregulation in the early 1980s, regulators may have been unable to keep up with the technological changes caused by deregulation and increased competition in the industry. Examiners may not have been able to act swiftly enough to monitor and control excessive risk-taking by undercapitalized banks until it was too late. Moreover, examination staffs were being reduced just before the period in which the numbers of problem banks and failures were growing.[18]

In 1978, for example, the FDIC employed more than 1,700 field examiners. At the time, there were approximately 350 problem banks and seven failures. By 1984, after several years of staff cutbacks, the number of examiners had declined to about 1,400, but the number of problem banks had grown to more than 900. Yearly resolutions increased to more than 100. By 1988, field examiners had increased to 2,029, but more than 1,000 were relatively inexperienced. Meanwhile, the number of problem banks increased to 1,400 and resolutions approached 200 per year.

Turnover rates for experienced staff increased among regulatory agencies. The demand for examiners expanded from those dealing with banking agencies to those charged with monitoring thrifts. Approximately 2,000 thrifts failed during the same time period. Clearly, the frequency of examinations, given staff turnover and limitations, had to suffer at the very time the industry was undergoing major stress. Insufficient and inexperienced examiners and an increase of time between examinations may have contributed to delays in detecting insolvent banks.

Resolution Costs and Regulatory Behavior

Before hearing the "death rattle," regulators often granted capital forbearance--permission for an undercapitalized bank to continue operating without requiring recapitalization. Although not every undercapitalized bank was a likely candidate for resolution, all were unquestionably candidates for increased regulatory oversight and supervision. Regulators have the authority to force banks to raise eq-

18. The reduction in bank and thrift examiners in the 1980s was consistent with the Administration's policy at the time to reduce the regulatory role of government. See John O'Keefe, "The Texas Banking Crisis: Causes and Consequences, 1980-1989," *FDIC Banking Review*, vol. 3, no. 2 (Winter 1990), pp. 1-34, for a description of how staff reductions contributed in part to the banking crisis in Texas.

uity, suspend dividends, reduce assets, issue new stock, force divestiture of affiliates, remove directors or managers, demand increased allowances for loan losses, or charge off uncollectible loans. Enforcing such actions on these undercapitalized banks may have caused even more failures. It is not difficult to imagine why many banks were initially permitted to continue to operate. In many cases, regulators decided not to enforce supervisory actions, presumably because they felt there was a higher probability that these banks would survive than that they would fail.

Forbearance. Forbearance comes into play when bank supervisors decide not to enforce some regulations, including capital requirements, under special circumstances.[19] In theory, a policy of forbearance gives economically functional banks--those that may be undergoing a short-term liquidity crisis--time to adjust to market conditions without triggering otherwise applicable bank regulations. Some forbearance policies are implicit, such as the treatment of banks designated for the FDIC problem banks list. Thus, problem banks are given time to comply with various supervisory actions intended to correct operational deficiencies.

Other policies of forbearance are explicit. For example, as losses on agricultural and energy loans rose during the 1980s, in the Competitive Equality Banking Act (CEBA) of 1987, the Congress "mandated capital forbearance" for agricultural banks--those banks with more than 25 percent of assets devoted to the agricultural sector. One condition for entry into the program was a formal plan (recognized by the bank's directors) for restoring the capital-to-asset ratio to the regulatory minimum of 5.5 percent. Regulatory supervisors stipulated that banks in the forbearance program limit growth of total assets and high-risk investments, restrict dividends to shareholders, and limit insider loans during forbearance.[20]

In practice, forbearance was granted to banks that turned out to be incapable of surviving. Approximately 63 percent of the banks that the FDIC resolved between 1985 and 1989 were considered undercapitalized for more than a year before failure. Approximately 28 percent of bank resolutions between 1987 and 1992 were insolvent by book-value measures at least one year before their resolution. Based on the resolution costs per dollar of assets during the 1980s, it is reasonable to suspect that forbearance could have contributed to the increased costs of resolution. If the losses were already embedded, however, the costs of resolution need not have increased.

A measure of the success or failure of a policy of forbearance can be obtained by examining how well regulators were able to restrict the activities of undercapitalized banks. One study examines a sample of 531 undercapitalized banks between 1985 and 1989 that were permitted to remain undercapitalized for at least one year.[21] Although regulators were able to restrict the majority of banks from engaging in questionable activities, regulators did not have complete control. For example, while they were undercapitalized, 16 percent of these banks increased assets by more than 10 percent, 15 percent continued to pay dividends, and 24 percent reported high levels of insider loans. Clearly, dividend payments and insider loans contributed to an increase in resolution costs for those institutions that did not recover.

FDICIA and Prompt Corrective Action

The Federal Deposit Insurance Corporation Improvement Act of 1991 authorizes a policy of "prompt corrective action" by bank supervisors in dealing with financially weakened banks. In FDICIA, the kind of prompt corrective action that is required of regulators depends on how a bank is rated in terms of minimum prescribed capital levels.

19. R. Alton Gilbert, "Supervision of Undercapitalized Banks: Is There a Case for Change?" in Federal Reserve Bank of Chicago, *Rebuilding Banking: Proceedings from the 27th Annual Conference of Bank Structure and Competition, May 1-3, 1991*, p. 338.

20. Dean Forrester Cobos, "Forbearance: Practices and Proposed Standards," *FDIC Banking Review* vol. 2, no. 1 (Spring/Summer 1989), pp. 20-28.

21. Gilbert, "Supervision of Undercapitalized Banks," p. 335. Gilbert defines undercapitalized banks as those exhibiting primary capitalization of less than 5.5 percent.

The act defines five levels of capital that trigger mandated levels of regulatory scrutiny--namely, well capitalized, adequately capitalized, undercapitalized, significantly undercapitalized, and critically undercapitalized. For example, if a bank is found to be undercapitalized, the law says it must develop a capital restoration plan that would include plans to meet capital requirements and restrictions on activities until capital has been restored. Under FDICIA, the FDIC may take action to resolve institutions when tangible equity-to-asset ratios slip below 2 percent.

But the concepts of "early" and "timely" closure should not be confused. In practice, if resolutions had been more timely--that is, before embedded losses drove the market value to zero without being revealed by measures of book value--some asset deterioration could have been eliminated and the cost to the insurance fund reduced. If banks suffer embedded losses before the 2 percent threshold is reached, cost savings from early closure of the resolution may be minimal. If banks only suffer embedded losses after reaching the 2 percent threshold, savings may be substantial. The amount of savings to the insurance fund under early closure depends on (1) how well book-value measures approximate market values, and (2) how long the losses realized at resolution are actually embedded in the book value of assets before resolution of an undercapitalized bank. Some banks may degenerate quickly. Others may suffer losses over a long period before resolution. Using a simulation model to quantify the results of timely resolution for banks resolved in 1990, savings can amount to as much as 59 percent of resolution costs if the embedded losses occurred within a year of closure (see Appendix C).

The speed of erosion in book-value capitalization is one indicator of a bank's deterioration (see Table 7). The average bank that was resolved in

Table 7.
Average Equity-to-Asset Ratios of Banks Before Resolution by the Federal Deposit Insurance Corporation, 1987-1992 (In percent)

Year Bank was Resolved by the FDIC	Equity-to-Asset Ratios					
	Year of Resolution	One Year Before Resolution	Two Years Before Resolution	Three Years Before Resolution	Four Years Before Resolution	Five Years Before Resolution
1987	2.2	n.a.	n.a.	n.a.	n.a.	n.a.
1988	1.7	5.9	n.a.	n.a.	n.a.	n.a.
1989	-0.4	4.9	7.2	n.a.	n.a.	n.a.
1990	0.5	5.0	7.6	9.9	n.a.	n.a.
1991	1.4	6.0	7.7	8.8	12.7	n.a.
1992	0.5	3.5	6.5	7.4	8.4	10.6

SOURCE: Congressional Budget Office analysis based on data supplied by the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTES: Sample of banks includes banks resolved over the 1987-1992 period, with data available on assets at the end of 1986 and continuing through the year of resolution.

Averages are unweighted and computed using a sample of banks with consistent data for all years. In each row, the group of banks includes only those banks resolved in the year displayed.

FDIC = Federal Deposit Insurance Corporation; n.a. = not applicable.

1990, for example, had a book equity-to-asset ratio of almost 10 percent at the beginning of 1987, three years before resolution. By early 1988 the equity-to-asset ratios had declined but still appeared to be respectable, exceeding 7 percent. By 1989, however, the ratio had slipped to 5 percent, and finally, by 1990, the ratio had dropped to 0.5 percent--barely solvent by book-value measures. In many cases, with the notable exception of 1991 resolutions, equity-to-asset ratios for the average resolved bank were below the regulatory minimum one year before failure, thus requiring some regulatory action. It is also true that while the equity-to-asset ratios were declining on average for banks resolved during this period, the most significant deterioration occurred in the year before resolution. This may indicate rapid erosion of equity or regulatory action requiring an enumeration of bad assets.

The main rationale for a policy of early closure is that a fixed-rate deposit insurance system can tempt banks to take excessive risks at the expense of the insurance fund. But a policy shift in terms of supervisory actions has occurred under FDICIA. Whereas regulators tried in the past to avoid closing healthy banks by waiting for book-value insolvency (the death rattle), FDICIA mandates that regulators take that risk by applying an early closure rule. The goal is to prohibit banks from operating at very low levels of capital--considered to be the region of highest moral hazard. Critics of the early closure rule argue that unless regulatory supervision and oversight keeps banks from taking excessive portfolio risks before reaching the 2 percent level, they will simply gamble sooner than they would have otherwise.[22] Nevertheless, effective supervision and oversight should limit losses. FDICIA also emphasizes early intervention as part of a policy of prompt corrective action, requiring increasing levels of supervision at lower levels of bank capital.

Rigid adherence to the 2 percent closure rule, however, may force the resolution of solvent banks that are merely undergoing a temporary crisis. It is difficult to assess the costs of mistaken early resolutions, given that regulators up to this point did not close banks before book-value insolvency. Two 1991 studies indicate that most banks that were undercapitalized between 1985 and 1989 did not recover.[23] One of these studies reports that only 24 percent of the undercapitalized banks recovered in the period examined. That study concludes that the prompt closing of banks with low but positive capital ratios "would not result in premature closings of large numbers of banks that ultimately would recover if given enough time."[24] To reduce the likelihood of incurring costs under premature closures, it may be useful to employ a flexible set of criteria in which early closures are limited to banks that are also displaying other characteristics of economic decay, such as earnings losses in consecutive years or failure to comply with regulatory recommendations.

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22. Mark E. Levonian, "What Happens if Banks Are Closed Early," in Federal Reserve Bank of Chicago, *Rebuilding Banking: Proceedings of the 27th Annual Conference on Bank Structure and Competition, May 1-3, 1991*, pp. 273-295.

23. See George E. French, "Early Corrective Action For Troubled Banks," *FDIC Banking Review*, vol. 4, no. 2 (Fall 1991), p. 12; and Gilbert, "Supervision of Undercapitalized Banks," p. 345.

24. Gilbert, "Supervision of Undercapitalized Banks," p. 346.

Chapter Five

An Industry Outlook: Guarded Optimism

In 1992 and 1993, after several years of poor performance, the banking industry earned record profits. The average return on assets for commercial banks in 1993 was 1.2 percent--the first time since the creation of the Federal Deposit Insurance Corporation that the annual return exceeded 1 percent. At the same time, the return on equity for the industry exceeded 15 percent.

Several factors contribute to the improved health of the banking industry, even as it undergoes continued structural change and consolidation. In particular, favorable interest rate conditions and a growing economy have enabled banks to prosper. Banks have been able to take advantage of the fact that they can pay less for their liabilities and receive greater returns on assets. Growth in noninterest income also contributed to higher earnings. Moreover, the growing economy has helped to reduce the amount of troubled assets--noncurrent loans declined in all regions of the country and among all major loan categories--which means that banks do not have to set aside as much money to cover potentially bad loans. In 1993, commercial banks set aside $16.6 billion to cover loan losses, the lowest annual total since 1984.[1]

Although the banking industry has generally improved, some remnants of the troubled times remain. As a group, money center banks ($10 billion or more in assets) have 4 percent of their real estate loans in noncurrent or past-due status, and had 14 percent of their construction and development real estate loans in noncurrent status as of the fourth quarter of 1993. Also for this period, some 570 troubled banks with $330 billion in assets, or 4 percent of banks and 7 percent of bank assets insured by the Bank Insurance Fund, made the FDIC's problem bank list. Although favorable interest rate conditions have allowed banks to increase profits and replenish their capital, their increased exposure to interest rate risk warrants guarded optimism.

The Exposure of the Bank Insurance Fund to Losses from Bank Resolutions

As the banking industry continues to earn record profits, the outlook for the BIF has improved. After incurring positive outlays from 1988 to 1992, the fund is now in the black. Its balance (net worth) rebounded to $6.8 billion at the second quarter of 1993 from negative $100 million at the end of 1992 and negative $7 billion at the end of 1991.[2] In its

1. See Federal Deposit Insurance Corporation, Division of Research and Statistics, *Quarterly Banking Profile, Fourth Quarter, 1993* (1994), pp. 1-2.

2. Federal Deposit Insurance Corporation, "Bank Insurance Fund Balance Increased to $6.8 Billion at Mid-Year 1993, According to Preliminary Results from the FDIC" (press release, August 10, 1993); and Barbara A. Rehm, "Bank Fund in the Black; Treasury Loan Repaid," *The American Banker* (August 11, 1993), pp. 1 and 22.

Table 8.
Assets and Resolution Costs of Resolved Banks, Grouped by Size, 1987-1992

Asset Size	Resolutions, 1987-1992		Assets Recorded at Time of Resolution		Resolution Costs to the Bank Insurance Fund	
	Number	Percentage of Total	Millions of Dollars	Percentage of Total	Millions of Dollars	Percentage of Total
Less Than $100 Million	824	79	23,352	11	5,504	19
Between $100 Million and $500 Million	163	16	37,362	17	7,054	24
More Than $500 Million	62	6	153,901	72	17,089	58
Total	1,049	100	214,615	100	29,647	100

SOURCE: Congressional Budget Office analysis based on data from the Federal Deposit Insurance Corporation.

NOTE: Banks are grouped according to assets recorded at time of failure.

January 1994 baseline, the Congressional Budget Office projected that the BIF will take in $8 billion more than it spends in fiscal year 1994 and continue in the black with a smaller excess over the next several years.

Projecting expected losses to the insurance fund is an important component of managing the fund. Longer-term projections of the assets and resolution costs can be helpful in setting deposit insurance premiums. Regulators use information on expected losses from resolutions, other expenses, and income to calculate appropriate levels for premiums. Two factors that influence the BIF's exposure to losses are capitalization and asset size of an insured institution. Generally, well-capitalized banks are healthy. Indeed, capitalization ratios are a major factor in the regulatory decision to resolve an institution. But more important for the insurance fund, the higher the level of capital for a bank, the larger the buffer (to absorb loan losses) between solvency and resolution. Furthermore, while small bank resolutions are more plentiful, resolving large banks places far greater pressure on the BIF. For example, during the 1987-1992 period, banks with assets greater than $500 million accounted for only 6 percent of the resolutions but 72 percent of the assets of resolved banks and 58 percent of the resulting losses to the BIF (see Table 8).

Projecting Assets of Bank Resolutions: An Actuarial Approach

For the most part, the past serves as a principal guide to the future. Although it is not possible to project failures of individual banks with great accuracy beyond the short term, industry analysts use several approaches to make long-term projections of the BIF's actuarial soundness. Sophisticated models based on historical data and statistical or simulation techniques can be used to predict bank failure.[3] Much can be learned, however, from a simple actuarial approach. An actuarial model divides the population of banks into groups based on indicators of risk to the fund, computes the historical incidence of resolution--a "mortality rate"--for each group over a given time period, and assumes that these group-specific rates will continue over the period

3. See J.B. Thompson, "Predicting Bank Failures in the 1980s," *Economic Review*, Federal Reserve Bank of Cleveland (1st Quarter 1991), pp. 9-20; and G. Whalen, "A Proportional Hazards Model of Bank Failures: An Examination of Its Usefulness as an Early Warning Tool," *Economic Review*, Federal Reserve Bank of Cleveland (1st Quarter 1991), pp. 21-31.

projected (see Box 2).[4] Mortality rates can be based on the number of resolutions or the assets of resolved institutions. Projecting resolved-bank assets provides better information when assessing potential losses to the Bank Insurance Fund because resolution costs are more directly related to assets.

At the end of 1986, banks faced a six-year period during which more than 1,000 would be resolved. By 1992, the condition of the banking industry had changed (see Table 9). The industry showed signs of consolidation as the number of banks fell from 14,660 in 1986 to fewer than 12,000 in 1992 and industry assets grew from $3.2 trillion to $3.7 trillion.[5] At the end of 1986, approximately 16 percent of the banks in the industry were capitalized at less than 6 percent. More important in terms of assessing the BIF's exposure to losses, only 53 percent of industry assets resided in banks that were capitalized at greater than 6 percent. By contrast, at the end of 1992, more than 95 percent of banks holding 85 percent of the industry's assets had equity-to-asset ratios greater than 6 percent.

One way to project assets of resolved banks for the 1993-1998 period is to apply the mortality rates derived from the incidence of resolutions during the 1987-1992 period to industry data from the end of 1992.[6] After applying historical rates to each subgroup, total projected assets of resolved banks can be derived as the total of all subgroups. Although the condition of the banking industry has improved, if the historical rates of resolution from 1987 through 1992 were to continue, the BIF would have to resolve more than $240 billion in assets (an average of $40 billion a year) during the next six years.[7] Estimates made using mortality rates derived from the 1987-1992 period on industry data split into subgroups as of the second quarter of 1993 are very close to estimates using year-end 1992 industry data. The six-year projection of resolved-bank assets using midyear 1993 data is $234 billion. The two estimates are close because the distribution of bank assets did not change much in the six-month period. Depending on assumptions about resolution costs per dollar of assets, projections of losses to the fund based on this estimate of resolved-bank assets could remain relatively high.

The six years of the 1987-1992 period included a national recession, several regional downturns, and particularly high losses on loans. There is evidence, however, that mortality rates have changed in the wake of two years of record profits in the banking industry and better overall economic conditions. Moreover, since the passage of the Federal Deposit Insurance Corporation Improvement Act of 1991, there have been two years of phasing in prompt corrective action. At the close of 1993, there were only 41 bank resolutions, the fewest in any year since 1982, when there were 42 resolutions. The assets of BIF-resolved banks have been falling from a record $63.4 billion in 1991 to $44.2 billion in 1992 and only $3.6 billion in 1993 (see Table 10). The average size of a resolved bank in 1993 was $87 million, down from $363 million in 1992. In addition, only 26 percent of resolved-bank assets in 1993 came from banks with assets greater than $500 million, down from 74 percent in 1992.

Thus, alternative projections of the assets of resolved banks can be made by extending mortality rates derived from more recent periods. If the historical sample is adjusted, it may better show the effect of recent structural and economic changes. For example, by extending the one-year mortality rates derived from resolutions in 1993 to cover a six-year period, it is possible to calculate an alterna-

4. For applications of the actuarial method of projecting losses to the Bank Insurance Fund, see Philip F. Bartholomew and Thomas J. Lutton, "Assessing the Condition of the Bank Insurance Fund," in Federal Reserve Bank of Chicago, *Rebuilding Banking: Proceedings of a Conference on Bank Structure and Competition, May 1-3, 1991*, pp. 87-111; and George E. French, "BIF Loss Exposure: A Simple Actuarial Approach," in Federal Reserve Bank of Chicago, *FDICIA, An Appraisal: Proceedings of the 29th Conference on Bank Structure and Competition, May 1993*, pp. 98-112.

5. The decrease in the number of banks includes resolutions by the FDIC and private mergers. The trend in consolidation continues; there were about 480 mergers in 1993, driving the number of commercial banks below 11,000.

6. The latest available year-end data are for 1992. The six-year mortality rates will give projections for 1993-1998. The observed data for 1993 can be used to adjust these six-year projections to give estimates for the 1994-1998 period.

7. This six-year projection of $240 billion in assets of resolved banks is consistent with a three-year projection of $120 billion (1993-1995) reported by the FDIC in May 1993. See French, "BIF Loss Exposure: A Simple Actuarial Approach," p. 102. These estimates are continually revised on the basis of examiner data and changing assumptions about economic conditions. FDIC and CBO estimates of assets of resolved banks have been revised downward a few times since this estimate was reported.

Box 2.
An Actuarial Framework: Mortality Rates Based on Capitalization and Asset Size

An actuarial framework is useful in examining resolutions that took place between 1987 and 1992. The first step is to classify a bank's assets at a beginning period into different groups based on two dimensions that are directly related to the Bank Insurance Fund's exposure to losses--for example, capitalization and asset size (see table at right). Each institution is grouped according to book-value data recorded at the end of 1986. There are five groups based on capital ratios, and within each of these five groups there are three subgroups divided by size of institution.

Incidence of Asset Resolution

The analysis in the accompanying table records the percentage of assets of banks that were resolved (the "mortality rate" of bank assets) across the different subgroups for the six-year period from 1987 through 1992. The relative incidence of asset resolution over the period in each asset size and equity-to-asset group provides a simple measure of the probability of resolution. The change in the incidence of asset resolution from one group to another in the table clearly indicates that the better capitalized banks were less likely to require resolution than poorly capitalized banks.

Groups of Banks Contrasted

For example, 6 percent of the assets in place in 1986 for Group 1 banks with equity-to-asset ratios greater than 6 percent had to be resolved between 1987 and 1992. By contrast, assets of book-value insolvent banks in Group 5 had an 89 percent chance of requiring resolution by 1992. An average of 7 percent of assets ($237 billion) held by banks at the end of 1986 were resolved over the six-year period.

Assets of Banks Insured and Resolved by the FDIC, Grouped by Capitalization Ratios and Size, 1987-1992

Group/Size	Assets on December 31, 1986 (Billions of dollars) Commercial and Savings Banks	Assets on December 31, 1986 (Billions of dollars) Resolved Banks	Ratio of Resolved Bank Assets to Industry Assets (Percent)
Group 1[a]			
Large	1,129	66	6
Medium	271	20	7
Small	289	15	5
Subtotal	1,689	101	6
Group 2[b]			
Large	1,273	79	6
Medium	85	12	14
Small	56	6	12
Subtotal	1,414	98	7
Group 3[c]			
Large	53	26	49
Medium	4	2	35
Small	3	1	34
Subtotal	61	29	47
Group 4[d]			
Large	3	1	29
Medium	3	2	63
Small	2	2	88
Subtotal	8	5	57
Group 5[e]			
Large	2	2	100
Medium	2	2	100
Small	2	2	69
Subtotal	6	6	89
Total	3,178	237	7

SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTE: Large banks have assets greater than $500 million, medium-sized banks have assets between $500 million and $100 million, and small banks have assets less than $100 million.

a. Equity-to-asset ratios greater than 6 percent.

b. Equity-to-asset ratios between 3 percent and 6 percent.

c. Equity-to-asset ratios between 1.5 percent and 3 percent.

d. Equity-to-asset ratios between zero and 1.5 percent.

e. Equity-to-asset ratios less than zero.

Table 9.
An Analysis of Banks and Bank Assets Insured by the Federal Deposit Insurance Corporation, Grouped by Capitalization Ratios and Asset Size, 1986 and 1992

Group/Size	Percentage of Commercial and Savings Banks		Percentage of Assets of Commercial and Savings Banks	
	As of December 31, 1986	As of December 31, 1982	As of December 31, 1986	As of December 31, 1992
Group1[a]				
Large	3.4	5.4	35.5	62.1
Medium	13.3	21.9	8.5	14.1
Small	67.0	67.7	9.1	9.1
Subtotal	83.7	95.1	53.1	85.3
Group 2[b]				
Large	1.0	0.5	40.1	13.0
Medium	1.9	1.2	2.7	0.9
Small	11.4	2.5	1.8	0.3
Subtotal	14.3	4.3	44.5	14.2
Group 3[c]				
Large	0.1	0	1.7	0.1
Medium	0.1	0.1	0.1	0.1
Small	0.7	0.2	0.1	0
Subtotal	0.9	0.3	1.9	0.2
Group 4[d]				
Large	0	0	0.1	0.1
Medium	0.1	0	0.1	0
Small	0.5	0.1	0.1	0
Subtotal	0.6	0.2	0.3	0.1
Group 5[e]				
Large	0	0	0.1	0.1
Medium	0.1	0.1	0.1	0.1
Small	0.4	0.1	0.1	0
Subtotal	0.5	0.2	0.2	0.2
Total	100.0	100.0	100.0	100.0
Memorandum:				
Number of Banks	14,660	11,983	n.a.	n.a.
Total Assets (Billions of dollars)	n.a.	n.a.	3,178	3,725

SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTE: Large banks have assets greater than $500 million, medium banks have assets between $500 million and $100 million, and small banks have assets of less than $100 million.

n.a. = not applicable.

a. Equity-to-asset ratios greater than 6 percent.

b. Equity-to-asset ratios between 3 percent and 6 percent.

c. Equity-to-asset ratios between 1.5 percent and 3 percent.

d. Equity-to-asset ratios between zero and 1.5 percent.

e. Equity-to-asset ratios less than zero.

Table 10.
Assets and Resolution Costs of Resolved Banks, Grouped by Size, 1992 and 1993

Asset Size	Resolutions		Assets Recorded at Time of Resolution		Average Asset Size (Millions of dollars)	Resolution Costs to the BIF (Millions of dollars)
	Number	Percentage of Total	Millions of Dollars	Percentage of Total		
			1992 Resolutions			
Less Than $100 Million	74	61	2,793	6	38	487
Between $100 Million and $500 Million	33	27	8,748	20	265	971
More Than $500 Million	15	12	32,691	74	2,179	3,252
Total	122	100	44,232	100	363	4,710
			1993 Resolutions			
Less Than $100 Million	33	80	1,210	34	37	199
Between $100 Million and $500 Million	7	17	1,417	40	202	236
More Than $500 Million	1	2	931	26	931	82
Total	41	100	3,558	100	87	516

SOURCE: Congressional Budget Office based on data from the Federal Deposit Insurance Corporation.

NOTES: Banks are grouped according to assets recorded at time of failure.

BIF = Bank Insurance Fund.

tive projection of assets of resolved banks. Rates can be adjusted further to account for elements of prompt corrective action by assuming that mortality rates are virtually 100 percent for banks with equity-to-asset ratios less than 1.5 percent (Groups 4 and 5) in 1992. The resulting projection of the assets of resolved banks indicates that only $33 billion worth of assets may need to be resolved between 1993 and 1998 (an average of $5.5 billion per year).[8] This estimate of resolved-bank assets is consistent with a recent FDIC estimate of the BIF's exposure to losses; the FDIC predicts that $5.8 billion in assets will have to be resolved in 1994.[9]

The wide range of projected assets of resolved banks reflects the sensitivity of estimates to assumptions and reveals a weakness in this approach. A principal weakness of the actuarial method is that it

8. An additional alternative is to derive estimates based on two-year "mortality rates" using 1992 and 1993 resolutions and data from the end of 1991 on the banking industry (also adjusting rates in Groups 4 and 5 to allow for elements of prompt corrective action). Projections based on these assumptions amount to an estimate of $157 billion in assets that may require resolution from 1993 to 1998 (an average of $26 billion in assets per year).

9. Barbara A. Rehm, "42 Banks Failed Last Year, Smallest Number Since 1982," *The American Banker* (January 5, 1994), p. 3.

is sensitive to the period over which the historical sample is chosen. The chance that the assets of an institution will be resolved in the future is based entirely on rates from the previous period among banks with similar characteristics. Another weakness is that only a limited number of characteristics are used to assign banks to groups reflecting risk of loss. The characteristics that are chosen allow the model to account implicitly for the ways in which local and national economic trends affect the condition of the industry. The reason is that, over time, banks move among groups based on changes in these characteristics; for example, when there is an improvement in capitalization or growth in assets an institution may move to a group with reduced risk of resolution. Several factors, however, influence the incidence of resolution for a particular subgroup. Because it has such a limited characterization of institutions, the model cannot explicitly account for the ways in which structural and economic changes affect mortality rates. Thus, the choice of sample significantly determines projected estimates. For example, actuarial projections using mortality rates derived from the 1960s would be very different (lower) than estimates using comparable rates from the 1980s.

One of the advantages of the actuarial approach is its simplicity. Using a limited amount of data and some judgment about the appropriate historical period to account for structural and other external time-varying factors, projections from this model can be used along with other indicators as a guide to estimates of the BIF's exposure to losses. Separating the industry into capitalization and size categories also provides a useful method of comparing the condition of the industry over a period of time (see Table 9).

Reforms in FDICIA and Some Remaining Policy Issues

Concerns about the financial condition of the banking industry and the ability of the Federal Deposit Insurance Corporation to cover losses from the alarming number of resolutions in the 1980s were major motivating factors for the Federal Deposit Insurance Corporation Improvement Act of 1991. Along with recapitalization of the Bank Insurance Fund, a major theme of this legislation is to foster "safety and soundness" in the banking industry. Three of the five titles of FDICIA deal with safety and soundness or regulatory improvement. Interestingly, safety and soundness was the major theme of the Banking Act of 1933 that established the Federal Deposit Insurance Corporation. As a follow-up to FDICIA, the Congress is engaged in continuous oversight of the health of the banking industry and the deposit insurance fund.[10]

A little over two years since its passage, it is difficult to evaluate fully the effects of FDICIA. Nevertheless, the reforms that the act put in place appear to have addressed directly some of the major problems identified during the 1980s--a period that put considerable stress on the regulatory and deposit insurance systems. For example, during the 1980s there was evidence of increased risk in the asset portfolios of banks. The deposit insurance system subsidized risk taking by banks during this period because insurance premiums were unrelated to risk of failure. Banks were particularly tempted to increase returns through riskier instruments because, in effect, any increase in risk was subsidized by the deposit guarantee system. Under FDICIA, the FDIC is required to set premium levels that are sensitive to risk. Moreover, the FDIC must set premiums at a level designed to recapitalize the Bank Insurance Fund to a reserve ratio of 1.25 percent within a 15-year period.

In 1988, the Basle Accord introduced the Bank for International Settlement (BIS) capital standards for banks involved in international finance. The BIS standards require that these banks maintain a capital ratio (based on a risk-weighted measure of assets) of at least 8 percent. FDICIA extends the BIS standards to all banks covered by deposit insurance and requires that regulators periodically review and revise risk-based capital standards to take better account of risks. Higher capital standards also address the deposit insurance system's implicit sub-

10. F. Jean Wells, "Banks and Thrifts: Post-FIRREA, Post-FDICIA," CRS Issue Brief (Congressional Research Service, March 29, 1993).

sidy of risk taking by forcing banks to improve the internalizing of the costs of their portfolio decisions. Also, the larger buffer of capital between solvency of an institution and resolution by the FDIC reduces the risk that taxpayers will have to bail out the fund because failed banks have caused excessive losses.

FDICIA requires annual on-site examinations of insured institutions and generally tougher supervision and regulation.[11] Moreover, the act requires that bank regulators employ regulatory constraints--depending on how a bank is rated in the way it meets minimum prescribed capital levels--and prompt closure of severely undercapitalized institutions. These requirements address the possibility of surprises caused by infrequent examination. More frequent examinations are necessary for prompt corrective action, especially during periods when conditions are deteriorating quickly. Regulators should be better able to take timely supervisory actions with the improved information from examinations. More timely supervision is an attempt to handle the problems of poorly capitalized institutions before they can increase the risk of loss to the insurance fund.

Because banks are operating in a competitive environment, it is uncertain whether the "safety and soundness" provisions of FDICIA will interfere with the ability of banks to make profits in the long term. The share of financial assets held by commercial banks dropped from 57 percent in 1946 to about 30 percent in 1990--and three of the top five issuers of credit cards are not banks--which shows how competitive the environment has become.

The record profits in the two years following enactment of FDICIA tend to obscure the fact that the banking industry has been losing ground to other types of financial services. But to a degree, banks are earning profits by taking advantage of low interest rates, a strategy that exposes them to increased risk in the interest rate market. Some industry analysts are concerned that when economic conditions change so that the returns based on interest rate spreads narrow, it will expose some banks to increased risk of failure. Given the possibility that changing economic conditions may make the industry susceptible to such periodic crises, policymakers are interested in making further structural changes in the banking industry.[12] They are interested in legislative reform that would enable banks to diversify, either geographically or through various product offerings. The Congress is considering an interstate branching bill that would permit banks to diversify their loan portfolios across state lines.

Issues of Structural Reform on the Horizon

Currently, restrictions on interstate banking do not allow federally chartered banks to operate branches across state lines. Banks have developed ways to circumvent these restrictions by using holding companies that may own banks in other states if permitted to by state law. The McFadden-Pepper Act of 1927, as amended, prohibits national banks and state banks that are members of the Federal Reserve System from having branches outside their home state.[13] Most states, however, permit expansion through the bank holding company arrangement. In this way, banks (usually large banks) can diversify their loan portfolios nationally by opening up loan production offices across state borders.

The argument for reducing further restrictions on interstate banking reasons that bank branches will enable banks to diversify their loan portfolios across geographic boundaries, increase customer convenience, and facilitate lending to smaller borrowers. A customer moving from one state to another would not have to change accounts if branches of the institution holding the account were available in the new state. In addition, bank branches may be more efficient than loan offices for lending across state lines. Branches may be less expensive to maintain than a similar number of incorporated sub-

11. Recent legislation (the Community Development Banking and Financial Institutions Act of 1993, for example) specifically provides for regulatory relief in some cases and could water down provisions in FDICIA that call for annual examinations.

12. Barbara A. Rehm, "Policymakers Renewing the Call for Overhaul of Bank Regulations," *The American Banker* (February 17, 1994).

13. Donald T. Savage, "Interstate Banking: A Status Report," *Federal Reserve Bulletin*, vol. 79 (December 1993), pp. 1075-1089.

sidiary banks necessary under a holding company arrangement. Alternatively, there are concerns that federal legislation removing interstate banking restrictions would impair loan service to local communities because of an increased tendency toward industry consolidation, perhaps yielding fewer small, community banks. There are also related concerns that reduced branching restrictions would make it difficult to guard against monopolization of deposits by large banks at the state, regional, and national levels.

Two of the pieces of legislation proposing interstate branching introduced in the 103rd Congress are S. 1963 and H.R. 3841. (The Senate Banking Committee approved S. 1963 on February 24, 1994, and the House of Representatives passed H.R. 3841 on March 9, 1994.) These bills would permit interstate acquisitions by adequately capitalized banks one year after enactment and interstate branching within two to three years. They also address concerns about monopolization by prohibiting any bank from holding more than 25 percent or 30 percent (the Senate and House limits, respectively) of the insured deposits in any state or 10 percent of national insured deposits.

The issues of increased competition and the decline of assets held by banks in relation to nonbanks have led to a call for legislation that would allow banks to diversify their assets further--specifically, by allowing banks to offer securities and insurance products. Opinions differ as to whether such changes would remove barriers to profitable enterprises or increase the risk of loss to the public. Mortality rates might increase because risky nonbanking enterprises impose larger losses on banks. Alternatively, better diversification could reduce the risk of loss. The issue remains controversial and there are, at present, no bills before the Congress that would allow banks to diversify their product lines.

Appendixes

Appendix A

Methods of Evaluating the Financial Condition of Banks

The criteria for safety and soundness require that regulators monitor banks to target financially weak institutions. Regulators employ two methods to monitor the financial condition of banks and identify banks that are in danger of failing: on-site examinations and off-site monitoring through the use of economic models. Although banks must submit financial reports to regulatory authorities every quarter, the on-site examination process remains the primary method of monitoring banks. The Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991 requires on-site examinations at least once a year.[1]

On-Site Examinations

Regulatory agencies conduct periodic audits and on-site examinations at banks under their jurisdiction. Bank examiners consider a bank's financial condition, review its compliance with laws and regulations, and project its prospects for the future. Examinations usually include (1) an analysis and appraisal of the bank's assets, (2) an analysis of its earnings, (3) an evaluation of the bank's management and review of management policies, (4) an evaluation of audit and internal and external control procedures, and (5) a determination of the bank's capital and liquidity positions. Part of the examination process is designated solely for purposes of certifying safety and soundness. The intent of the safety and soundness examination is to verify that an institution has adequate capital and liquidity to conduct business within safe operating guidelines.

The three federal bank regulatory agencies--the Office of the Comptroller of the Currency, the Federal Deposit Insurance Corporation (FDIC), and the Federal Reserve--have a method of incorporating the results of an examination into a uniform interagency system for rating the condition and soundness of banks. The system involves an assessment of five critical aspects of a bank's operations and condition and is generally known by the acronym CAMEL--capital, asset quality, management, earnings, and liquidity. First, the examiner determines a numerical index from 1 to 5 for each of the five criteria categories--an index of 1 being the most favorable. The second part of the evaluation system involves combining these five indexes into a composite CAMEL rating of the bank's condition and soundness.

The FDIC uses the CAMEL rating to rank banks insured by the Bank Insurance Fund according to the financial risk they impose on the fund. Institutions with financial, operational, or managerial weaknesses that threaten their continued financial vitality are given a composite rating of 4 or 5, depending on the degree of risk and supervisory concern. The FDIC places banks in this category on its list of "problem" institutions, and they are monitored more frequently. Meanwhile, regulators move to address problems identified by the examiner and mandated by provisions in FDICIA for prompt corrective-action.

1. Section 111 of the Federal Deposit Insurance Corporation Improvement Act of 1991, 12 U.S.C. 1820, 105 Stat. 2240.

The process of on-site examination is expensive. It is labor-intensive and incurs heavy travel expenses for examiners. How effective the on-site system of monitoring banks is depends on the judgment, experience, and training of the examiners, the size of the examination staff, and the frequency of the examinations. Various methods have been used over the years to help reduce the expense of the examination process, such as alternating examinations with qualified state agencies.

In order to monitor bank operations between examinations, regulatory agencies review detailed financial and operating data--essentially book-value income and balance-sheet information--that banks must supply to the authorities on a quarterly basis. These detailed financial statements are known as "call reports." Beginning in the 1970s, the three federal regulatory agencies developed computerized information systems based primarily on call-report data. Transfer of the call-report data to computers made it possible to use electronic information processing for detecting emerging weaknesses.[2] When used for this purpose, the information system is generally known as an early-warning system (EWS).

Off-Site Detection: Early-Warning Systems

Computer-based models designed to act as early-warning systems complement the on-site examination process for detecting problem banks. As a practical matter, the time lapse between examinations makes it desirable for regulatory authorities to have more current information on a bank's underlying financial condition. Regulatory agencies use early-warning systems to determine which institutions may require more frequent examinations and which may present excessive risks to the deposit insurance fund.

There are two major categories of EWS models. One consists of models that measure degrees of risk or financial condition associated with individual banks. Examples of EWS models in this category include both discriminant models and options-pricing models. The second category includes various types of econometric models that estimate the probability of resolution of an institution based on its financial, structural, and economic characteristics. The logit statistical model and proportional hazards model are examples of econometric procedures used to estimate the probability of resolution.

Discriminant analyses represents one of the earliest attempts at using call-report data to spot possible problem banks. The discriminant model generates a statistical formula that separates banks into various categories of financial soundness based on an index value derived from the formula.[3] The variables used in estimating the formula are generally related to factors that examiners assess when determining a CAMEL rating. The factors include management quality (net earnings, dividends, and borrowing as a percentage of capital), asset quality, and capital adequacy (equity-to-asset measures). In order to calibrate the model and measure its usefulness for projections, the results of the off-site discriminant model can be compared with CAMEL ratings from on-site examinations. This kind of comparison was done by Eric Hirshorn, a financial analyst at the FDIC.[4] (CAMEL ratings are not available to the public). In his analysis, Hirshorn developed a risk-index formula using discriminant analysis to compare with CAMEL ratings. The index correctly classified about 70 percent of the financially weakened banks that the examiner assigned a CAMEL rating of 3, 4, or 5.

2. John F. Bovenzi, James A. Marino, and Frank E. McFadden, "Early Warning Systems and Financial Analysis in Book Monitoring," *Economic Review of the Federal Reserve Bank of Atlanta* (November 1983), pp. 1-34.

3. David P. Stuhr and Robert Van Wickler, "Rating the Financial Condition of Banks: A Statistical Approach to Aid Bank Supervision, *Monthly Review*, Federal Reserve Bank of New York (September 1974). See also Edward Altman and others, *Applications of Competitive Techniques in Business and Finance* (Greenwich, Conn.: JAI Press Inc., 1981); and Joseph Sinkey, Jr., "A Multivariate Statistical Analysis of the Characteristics of Problem Banks," *Journal of Finance*, vol. 30, no. 1 (March 1975), pp. 21-36. One analysis by John Myers and Howard W. Pifer, "Production of Bank Failure," *Journal of Finance*, vol. 25, no. 4 (September 1970), pp. 853-869, uses a discriminant analysis to demonstrate that real estate lending may lead to bank failure.

4. Eric Hirshorn, "Risk Related Deposit Insurance Premiums," *Banking and Economic Review* (Federal Deposit Insurance Corporation, 1986).

The options-pricing models are an outgrowth of the discriminant models. These models use data from the stock market and call reports to estimate the market value of assets for openly traded banks, which tend to be large banks and bank holding companies. These models can also be used to evaluate changes in risk over time. One study uses the options-pricing approach to examine risk for a sample of nine bank holding companies over the 1985-1991 period. Their results indicate little change in risk for these nine institutions during the seven-year period.[5]

Statistical techniques including the logit and proportional hazards models are used to help identify potential resolutions by estimating the contribution of various factors to the probability of failure.[6] Variables describing the financial condition and economic environment facing a bank are used in these statistical formulas to derive an index indicating the likelihood of failure for an institution over a particular time period. These models are a useful complement to other methods of projecting failures in the short run.

Type I and Type II Errors in Predicting Bank Failure

The process of identifying an institution at risk of failure is somewhat uncertain. It is important to understand that early-warning system models can erroneously predict the future status of an institution. A model can make two types of errors in projecting whether or not an institution will fail. It is possible to predict that a bank will not fail when, in fact, it does--this is known as a Type I error. Alternatively, it is possible to classify an institution that does not fail in the time period being considered as a failure--this is known as a Type II error.

In using an EWS, an analyst must choose a critical level (R) below or above which a bank can be classified as sound. In discriminant analysis, if the index of a bank exceeds a certain discriminant level (as the index rises the risk of failure increases), it is classified as a failure. Similarly, using logit analysis, the analyst must choose an index level of probability above which the bank is assumed to fail. For example, for a critical level of 0.5, any bank evaluated at a probability of 50 percent or more using the logit function will be classified as a failure.

The choice of the critical level (R) should not be arbitrary. Certain costs are associated with committing both classes of errors. If the value of R is too low, the model will tend to commit more Type II errors (predicting more nonfailures as failures) and fewer Type I errors (predicting fewer failures as nonfailures). The converse is true if the R value is too high. If increased exams or other supervisory actions are based on EWS projections of failures that turn out to be false alarms, the cost to regulatory agencies could increase unnecessarily. And yet, if banks that require supervisory actions between examinations are missed because of a high level of Type I errors, it could be costly to the Bank Insurance Fund.

One way to calibrate an EWS model is to use it to project failures for the historical sample period. By recording the number of correct and incorrect classifications at alternative levels of R, it becomes possible to choose a critical level that in principle minimizes the expected costs of misclassification. If the costs of classifying a failure as a nonfailure greatly exceed the costs of classifying a nonfailure as a failure, it may be reasonable to choose a low critical value. If the costs of committing a Type II error (classifying a nonfailure as a failure) are viewed as higher, choosing a relatively high R value will reduce the probability of committing a Type II error.

Given the uncertainty involved in spotting troubled banks, regulators do not rely on a single technique to evaluate an institution. They use reports from on-site examinations, CAMEL ratings, and various types of off-site early-warning system models to monitor the condition of banks.

5. Congressional Budget Office, "The Asset Risk of Money Center Banks," unpublished draft (June 1992).

6. Recent studies using logit and proportional hazards methods are J.B. Thompson, "Predicting Bank Failures in the 1980s," *Economic Review*, Federal Reserve Bank of Cleveland (1st Quarter 1991), pp. 9-20; and G. Whalen, "A Proportional Hazards Model of Bank Failure: An Examination of its Usefulness as an Early Warning Tool," *Economic Review*, Federal Reserve Bank of Cleveland (1st Quarter 1991), pp. 21-31.

Appendix B

Types of Resolutions: Data on Resolution Costs and Bank Resolutions

The incidence and size of failed banks and the least-cost criteria of resolving them have led to three general types of resolutions: payoffs and transfers, purchase and assumptions, and assistance transactions. As the need arises, the Federal Deposit Insurance Corporation (FDIC) develops methods of resolving institutions based on their legislative mandate and the condition of the market. (Table B-1 on page 57 presents summary measures for banks resolved by the FDIC over the 1987-1992 period by type of resolution transaction. Tables B-2 through B-6 provide information on the number, assets, and costs of resolved institutions over the period by year and by type of resolution transaction.)

Payoffs and Transfers

Payoffs and transfers are used here to describe a resolution in which virtually all of the liabilities of an institution are retained by the FDIC as receiver. As the receiver, the FDIC determines how the liabilities will be handled--in particular, whether to pay off insured depositors directly or transfer their accounts to a paid agent bank. The FDIC may also act as a receiver of some part or all of the assets of a failed bank in this or other methods of resolution. Generally, the FDIC chooses to become a receiver as a last resort--when it is unable to sell a bank to a private party. If insured deposits are relatively small, the bank may be a likely candidate for liquidation simply because the FDIC may be unable to attract competitive bids from other banks. Compared with other methods of resolving an institution, payoffs can require a large initial payout for covered liabilities.

The FDIC must perform a statutory cost test for all proposed resolution transactions. Before the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), the cost test required that a method of resolution be no more costly than the payoff (of insured depositors) and liquidation (of assets) method. FDICIA requires that the FDIC now consider all feasible methods of resolution and choose the least costly alternative.

The average-size bank that was resolved using a payoff or transfer over the 1987-1992 period held approximately $66 million in assets (see Table B-1). During this period, payoffs and transfers accounted for 18 percent of all resolutions and an estimated $3.8 billion in losses to the Bank Insurance Fund.

Payoffs. A payoff is a receivership in which the FDIC issues checks to insured depositors up to the $100,000 limit per account. The FDIC seeks to recover as much of this initial disbursement as possible by selling the assets of the failed bank. Disposition of the assets of a failed bank usually takes between five and seven years.[1]

1. For a discussion of the time distribution of recoveries on failed-bank assets, see Richard A. Brown and Seth Epstein, "Resolution Costs and Bank Failures: An Update of the FDIC Historical Loss Model," *FDIC Banking Review*, vol. 5, no. 1 (Spring/Summer 1992), p. 4.

Payoffs have generally been used for small banks with less than $100 million in assets; the average failed institution in this category held $63 million in assets by the time it was resolved. During the 1987-1992 period, losses per dollar of assets for payoffs were higher than for any other form of resolution, averaging 33 percent (see Table B-1). Even with such a high recorded cost per dollar of assets, since the institutions involved were small, these payoffs represented less than 3 percent of the cumulative resolution costs during this period.

Deposit Transfers. Another type of resolution in which the FDIC acts as a receiver of liabilities is the deposit transfer. Rather than pay out funds directly, the FDIC finds an agent bank to assume the insured and secured liabilities of the insolvent bank. In this case, the FDIC may pay the agent bank a premium with the expectation of recouping some of these losses from the assets of the failed institution. This method of resolution is called an insured deposit transfer and could be less costly than a payoff if an agent bank perceives some franchise value associated with the insured deposits. If the agent bank also acquires some portion of the assets of the failed bank, the resolution is referred to as a deposit insurance transfer and asset purchase.

In a deposit transfer transaction, the insolvent bank is closed and the insured and secured deposits often remain in the community in which they originated. Other eligible creditors share in the FDIC asset liquidation and may recoup some portion of their losses. In general, deposit transfers are costly in relation to other forms of nonreceivership resolutions, and losses averaged 31 percent of assets in the 1987-1992 period (see Table B-1).

Purchase and Assumptions

The second class of resolutions used by the FDIC are called purchase and assumption (P&A) transactions. In this method of resolution, solvent banks are permitted to bid on the assets and liabilities of a failed bank with the objective of assuming them. In a traditional purchase and assumption transaction, the failed bank is closed and an acquiring institution buys some of its assets, assuming its deposits and certain other liabilities (including nonsubordinated liabilities) with or without FDIC assistance. Before FDICIA, it was usual for all depositors, including those who were uninsured, to receive full payment on claims. In many cases, the failed institution is simply merged with another bank or reopened under new ownership and management. The main benefit of this form of purchase and assumption settlement is that it can to some degree avoid interruption in the availability of funds to all depositors.

Typically, purchase and assumption transactions involve smaller disbursements from the FDIC and lower losses per dollar of assets than payoffs or transfers. Acquiring banks usually pay a premium for a failed bank's charter that is large enough to reduce the estimated cost of a P&A transaction below that of a deposit payoff. For the P&A to be more cost-effective than a liquidation or deposit transfer, the franchise value of the failed-bank assets must be greater than the additional uninsured and secured liabilities that the acquiring bank must assume. In 1992, the FDIC developed a form of purchase and assumption in which only insured deposits are transferred. This relatively new form of resolution came about as a way of meeting the statutory least-cost requirements of FDICIA. It may encourage more bids for an institution because potential acquirers of a failed institution can balance failed-bank assets against covered liabilities only.

As a general class of resolutions, P&As made up 78 percent of resolutions between 1987 and 1992. For that period, average losses on assets for P&As was 13 percent (see Table B-1). The average size of P&A transactions was about $228 million, and this class of resolution accounted for 81 percent of the losses over the period.

Total Bank Purchase and Assumption. In a "total bank" or "total assets" purchase and assumption (TAPA), the FDIC sells virtually all of the assets of the closed insolvent bank to the assuming institution. In a TAPA transaction, all assets and liabilities--the insured and secured deposits as well as other liabilities--are removed from FDIC responsibility. Approximately 28 percent of resolutions from 1987 to 1992 were TAPAs. These resolutions made up 33 percent of total Bank Insurance Fund losses and averaged 14 percent of losses per dollar of assets over the period. The average size of a

bank resolved using the TAPA method was about $250 million at resolution.

As a way of minimizing losses, the FDIC tries to keep as many of the assets of a failed bank under private control as possible. In a TAPA transaction, virtually all assets are assumed by the acquirer in exchange for one-time financial assistance. That is, the assuming bank is paid a "negative premium" by the FDIC to assume the risks associated with assets of the failed bank. In a total bank P&A, the acquiring institution faces uncertainty about the value of troubled assets. Because of the risk of loss associated with some of the assets in the portfolio, a potential acquirer may request a larger premium than the least-cost test can justify. Some of the uncertainty can be reduced if the FDIC retains the problem assets and allows the purchaser to assume the "clean" assets in the transaction.

Clean Bank and Other P&As. At the other extreme from a TAPA is the "clean bank" transaction in which only assets that are assessed to be of relatively low risk are transferred to the acquiring institution. In other variations of purchase and assumption transactions, the FDIC agrees to purchase back some or all of the risky assets, if the assuming bank chooses to "put back" these loans in a specified time period. In some cases, the assuming bank agrees to keep all loans under a predetermined size with a no putback option. The larger the original loans and the higher the risk determination, the more putbacks a P&A will probably involve. As more putback options are invoked, a greater amount of assets must be held by the FDIC.

Clean banks and non-TAPA forms of assumptions were the most common resolution methods used during the 1987-1992 period, averaging 46 percent of all resolutions and 42 percent of BIF losses. Losses per dollar of assets averaged 13 percent and the average size of a failed bank in this category was $200 million (see Table B-1).

P&As Covering Insured Deposits Only. After FDICIA, the FDIC deviated from the traditional purchase and assumption transaction in which all deposits are assumed by the acquiring bank. In the newly developed form of P&A, the acquiring bank assumes only insured deposits (PIs). This type of transaction may make an institution more attractive to potential acquirers and can reduce losses to the insurance fund. The PI method of resolution was used for 42 banks with an average size of more than $400 million during the first year it became available (1992). The cost per dollar of failed bank assets is lowest among all forms of resolutions used over the 1987-1992 period. Losses to the insurance fund from these transactions amount to almost $2 billion, however, because of the asset size of failed banks in this class of resolutions.

Assistance Transaction Resolutions

The third class of resolutions involves assistance to banks that are experiencing temporary financial problems or are on the verge of failing for which the FDIC has become a conservator. This is the most controversial form of resolution because it may either subsidize the stockholders of potentially insolvent banks--open-bank assistance (OBA)--or, in the case of bridge banks, involve government investment, ownership, and operation of insolvent banks. The FDIC used assistance transactions to resolve 47 banks from 1987 to 1992, causing about $1.8 billion in losses to the Bank Insurance Fund. These banks were larger than banks that were resolved through either traditional P&As or receiverships. Although assistance transactions made up only 4 percent of recent resolutions, they accounted for 6 percent of estimated losses to the insurance fund over the period. Estimated losses per dollar of assets were, on average, the second lowest of any resolution method during the period.

Open-Bank Assistance. All forms of direct financial assistance by the FDIC to an operating bank are known as open-bank assistance. Such assistance can take the form of promissory notes, net worth certificates, cash, assumptions of debt, guarantees against loss, and infusions of equity. In OBAs, unlike all other forms of resolution, the original charters are not revoked.

The FDIC first used its OBA authority in 1971. Before 1982, OBA was not considered a method of resolution. But the use of OBA as a method of resolution became more prominent after the Federal Depository Institutions Act of 1982, which allowed

the FDIC to grant financial assistance in the form of OBA to any bank in a weakened condition, as long as the cost of OBA was less than the cost of liquidation. Granting aid under open-bank assistance generally requires less capital than either P&As or liquidations.

The government declared no losses in four of the first five cases of OBA. Open-bank assistance has usually been used for larger institutions that require assistance (for example, Continental Illinois, a $33.6 billion bank resolved in September 1984, and First City BanCorporation, an $11.2 billion bank resolved in April 1988). This resolution method has been criticized because, although management often changes under OBAs, it may subsidize stockholders of a potentially insolvent institution by allowing it to continue to operate.

Bridge Banks. The Competitive Equality Banking Act of 1987 expanded the FDIC's powers to handle bank failures by temporarily granting "bridge bank authority." Under this authority, the FDIC operates a failed institution for up to two years, with options to extend operation for up to three years. Two examples of bridge bank transactions are the First Republic Bancorporation, a $33.7 billion bank resolved in 1988, and MCorp, a $15.4 billion bank resolved in 1989. Bridge banks are a type of conservatorship in which prospective buyers can assess the bank's condition.

Under a bridge bank transaction, management is replaced and holding company creditors and shareholders lose their investments. This option gives the FDIC additional time to arrange a merger or purchase and assumption transaction, the expected costs of which are included in the initial estimate of bridge bank losses. Bridge banks are only temporary resolutions. The potential for moral hazard problems associated with operating a collection of failing institutions is, in principle, limited because the FDIC is technically managing bank operations. Bridge banks, however, are not without their problems. If the FDIC applies a bridge bank solution to a local bank, other banks in the region are placed in competition with a government-run bank.

Table B-1.
Summary Statistics for Banks Resolved by the Federal Deposit Insurance Corporation, by Type of Resolution, 1987-1992

Type of Resolution	Banks Resolved, 1987-1992		Estimated Losses to the Bank Insurance Fund		Assets Recorded at Time of Resolution		Losses as a Percentage of Assets[a]	Average Asset Size of Resolved Banks (Millions of dollars)[a]
	Number of Banks	Percentage of Total	Millions of Dollars	Percentage of Total	Millions of Dollars	Percentage of Total		
Payoffs and Transfers								
Deposit payoff	49	5	1,031	3	3,105	1	33	63.4
Deposit transfer	135	13	2,755	9	9,020	4	31	66.8
Subtotal	184	18	3,786	13	12,125	6	31	65.9
Purchase and Assumption								
Total bank	291	28	9,802	33	72,120	34	14	247.8
Insured deposits only	42	4	1,771	6	17,159	8	10	408.5
Other	485	46	12,536	42	97,015	45	13	200.0
Subtotal	818	78	24,109	81	186,294	87	13	227.7
Assistance Transactions	47	4	1,753	6	16,196	8	11	344.6
Total	1,049	100	29,648	100	214,615	100	14	204.6

SOURCE: Congressional Budget Office analysis based on Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis, 1986-1992* (1993).

NOTES: Sample includes commercial and savings banks insured by the Bank Insurance Fund that were resolved between 1987 and 1992.

Assets are those recorded at time of resolution.

a. Figures represent averages for each type of resolution.

Table B-2.
Number of Banks Resolved by the Federal Deposit Insurance Corporation, by Year and Type of Resolution, 1987-1992

Type of Resolution	1987	1988	1989	1990	1991	1992	Banks Resolved, 1987-1992	
							Number of Banks	Percentage of Total
Payoffs and Transfers								
Deposit payoff	11	6	9	8	4	11	49	5
Deposit transfer	40	30	22	12	17	14	135	13
Subtotal	51	36	31	20	21	25	184	18
Purchase and Assumption								
Total bank	19	110	87	43	24	8	291	28
Insured deposits only	0	0	0	0	0	42	42	4
Other	114	54	88	105	79	45	485	46
Subtotal	133	164	175	148	103	95	818	78
Assistance Transactions	19	21	1	1	3	2	47	4
Total	203	221	207	169	127	122	1,049	100

SOURCE: Congressional Budget Office analysis based on Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis, 1986-1992* (1993).

Table B-3.
Resolution Costs as a Percentage of Assets for Banks Resolved by the Federal Deposit Insurance Corporation, by Year and Type of Resolution, 1987-1992

Type of Resolution	1987	1988	1989	1990	1991	1992	Banks Resolved, 1987-1992
Payoffs and Transfers							
Deposit payoff	34	29	50	28	28	29	33
Deposit transfer	27	32	33	31	35	25	31
Transaction Average	28	31	37	30	34	28	31
Purchase and Assumption							
Total bank	16	12	20	12	15	4	14
Insured deposits only	n.a.	n.a.	n.a.	n.a.	n.a.	10	10
Other	29	30	22	17	10	12	13
Transaction Average	27	12	20	17	10	10	13
Assistance Transactions	6	12	33	13	5	3	11
Overall Transaction Average	22	13	21	19	11	11	14

SOURCE: Congressional Budget Office analysis based on Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis, 1986-1992* (1993).

NOTES: Figures represent averages for each category of resolution by year. Averages are calculated as the total resolution costs divided by the total assets of failed banks for each type of resolution.

n.a. = not applicable.

Table B-4.
Average Asset Size of Banks Resolved by the Federal Deposit Insurance Corporation, by Year and Type of Resolution, 1987-1992 (In millions of dollars)

Type of Resolution	1987	1988	1989	1990	1991	1992	Average Asset Size of Resolved Banks, 1987-1992
Payoffs and Transfers							
Deposit payoff	30.3	21.8	64.5	104.9	16.8	105.0	63.4
Deposit transfer	53.0	40.3	73.8	137.9	89.2	64.0	66.8
Transaction Average	48.1	37.2	71.1	124.7	75.4	82.0	65.9
Purchase and Assumption							
Total bank	30.0	330.2	270.6	53.5	37.7	1,060.1	247.8
Insured deposits only	n.a.	n.a.	n.a.	n.a.	n.a.	408.5	408.5
Other	32.3	26.3	41.4	104.1	769.9	366.8	200.0
Transaction Average	32.0	230.1	155.4	89.4	599.3	443.7	227.7
Assistance Transactions	132.4	644.7	6.0	16.0	28.0	17.5	344.6
Overall Transaction Average	45.4	238.1	142.0	93.1	499.2	362.6	204.6

SOURCE: Congressional Budget Office analysis based on Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis, 1986-1992* (1993).

NOTES: Averages are derived from assets recorded at time of resolution.

Figures represent averages for each category of resolution transaction by year. Averages are calculated as total bank assets divided by the number of banks resolved for each type of resolution.

n.a. = not applicable.

Table B-5.
Total Assets of Banks Resolved by the Federal Deposit Insurance Corporation, by Year and Type of Resolution, 1987-1992 (In millions of dollars)

Type of Resolution	1987	1988	1989	1990	1991	1992	Assets Recorded at Time of Resolution, 1987-1992	
							Total for Period	Percentage of Total
Payoffs and Transfers								
Deposit payoff	333	131	580	839	67	1,154	3,105	1
Deposit transfer	2,121	1,209	1,624	1,655	1,517	895	9,020	4
Subtotal	2,454	1,340	2,204	2,494	1,584	2,049	12,125	6
Purchase and Assumption								
Total bank	570	36,321	23,543	2,300	905	8,481	72,120	34
Insured deposits only	n.a.	n.a.	n.a.	n.a.	n.a.	17,159	17,159	8
Other	3,686	1,422	3,647	10,928	60,824	16,508	97,015	45
Subtotal	4,256	37,743	27,190	13,227	61,730	42,148	186,294	87
Assistance Transactions	2,516	13,539	6	16	84	35	16,196	8
Total	9,226	52,622	29,400	15,737	63,398	44,232	214,615	100

SOURCE: Congressional Budget Office analysis based on Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis, 1986-1992* (1993).

NOTE: n.a. = not applicable.

Table B-6.
Resolution Costs of Banks Resolved by the Federal Deposit Insurance Corporation, by Year and Type of Resolution, 1987-1992 (In millions of dollars)

Type of Resolution	1987	1988	1989	1990	1991	1992	Estimated Losses to the Bank Insurance Fund, 1987-1992	
							Total for Period	Percentage of Total
Payoffs and Transfers								
Deposit payoff	114	39	289	231	19	339	1,031	3
Deposit transfer	574	382	535	513	525	226	2,755	9
Subtotal	688	421	824	744	544	565	3,786	13
Purchase and Assumption								
Total bank	90	4,254	4,701	286	133	338	9,802	33
Insured deposits only	n.a.	n.a.	n.a.	n.a.	n.a.	1,771	1,771	6
Other	1,065	433	786	1,904	6,311	2,036	12,536	42
Subtotal	1,155	4,686	5,488	2,190	6,445	4,145	24,109	81
Assistance Transactions	160	1,583	2	2	4	1	1,753	6
Total	2,003	6,690	6,315	2,937	6,993	4,710	29,648	100

SOURCE: Congressional Budget Office analysis based on Federal Deposit Insurance Corporation, *Failed Bank Cost Analysis, 1986-1992* (1993).

NOTE: n.a. = not applicable.

Appendix C

A Simulation of Embedded Costs

The process of determining when a bank has failed, thereby requiring resolution by regulators, has many uncertainties. In most cases, before the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) regulators closed banks when they became book-value insolvent--that is, when the book value of equity dropped to zero. An insolvency test based on book-value accounting, however, can be misleading because it may disguise an insolvent institution as book-value solvent for some time before book values reveal insolvency. At least two studies imply that the actual market value of assets revealed through the resolution process was only about 70 cents per dollar of the recorded book value at the time the resolution process began.[1] Had the condition of the banks been detected when the market value of assets was equal to liabilities and promptly resolved, perhaps some of the loss on assets (embedded losses) could have been avoided, thus reducing the costs to the Bank Insurance Fund.

FDICIA authorizes a policy of prompt corrective action under which the kind of action required of regulators is guided by the way in which a bank is rated in terms of minimum prescribed capital levels. Under FDICIA, the FDIC may take action to resolve institutions when their equity-to-asset ratios slip below 2 percent. If banks suffer embedded losses before the 2 percent threshold is reached, resolution-cost savings from early closure may be minimal. If banks suffer only embedded losses after reaching the 2 percent threshold, savings may be substantial. The possible savings under early closure rules depend on (1) how well book-value measures approximate market values, and (2) how long the losses realized at resolution are actually embedded in the book value of assets before the resolution of an undercapitalized bank.

As an illustrative exercise, this appendix uses a simulation model to examine the extent to which early closure might mitigate losses to the insurance fund. The model uses FDIC data on resolution costs, assets, and a few other financial variables from a sample of 140 banks that operated between 1986 and 1990 and were resolved sometime in 1990.[2] By making assumptions about when these losses actually occurred--as early as the end of 1986 or as late as 1990--it is possible to gauge market values and possible resolution costs to provide a range of estimates for the potential savings associated with early closure.

1. See John F. Bovenzi and Arthur J. Murton, "Resolution Costs of Bank Failure," *FDIC Banking Review*, vol. 1, no. 1 (Fall 1988), pp. 1-13; and Richard A. Brown and Seth Epstein, "Resolution Costs and Bank Failures: An Update of the FDIC Historical Loss Model," *FDIC Banking Review*, vol. 5, no.1 (Spring/Summer 1992), pp. 1-16.

2. The banks making up this sample of 140 resolutions represent 83 percent of the resolutions in 1990. The remaining 17 percent were excluded because of data limitations on some variables necessary for the simulation. Hence, the average values reported here are different from those recorded in the tables in Appendix B.

Sample averages (displayed in Table C-1) construct a time profile of the "representative" bank used in the simulation. Average assets for these banks resolved in 1990 were about $94 million (in 1990 dollars) in 1986. Assets for the group grew on average through 1987, at which time average net income became negative and remained that way until 1990. The average size of these banks fell from 1987 to 1990 to about $74 million at the time of resolution. In 1986, the representative bank held a book-value equity-to-asset ratio of 6.5 percent (on an asset-weighted basis). The average book-value ratio fell over the next four years until 1990, when these banks were resolved. Under FDICIA, the representative bank would have been resolved at least one year earlier because its equity-to-asset ratio on a book-value basis was below the 2 percent threshold in 1989.

Embedded losses can be defined as resolution costs above the costs that can be attributed to administrative expenses. For the purposes of the simulation, administrative costs of resolution are assumed to be 10 percent of the book value of assets at closure in 1990. Using this assumption and the average characteristics of failed banks, it is possible to estimate embedded losses and, hence, the market value of assets. The estimate of administrative costs for the representative 1990 closure is $7.4 million (see Table C-2). Embedded losses are thus $8.6 million and the market value of assets of the representative bank at closure is $65.1 million--roughly 12 percent below the book-value measure.

The simulation model assumes three banks identical in every way except for the timing of embedded losses on assets (see Table C-3). The first bank degenerates slowly over four years, and then experiences most of its embedded losses in 1990. The second bank experiences all embedded losses in 1986 (four years before resolution) with little deterioration of assets after the initial losses. The last bank experiences a gradual rise in embedded losses over the four-year period until resolution in 1990.

Savings could be substantial in the first case because early closure could avoid a significant amount of the embedded losses. Under the early closure rule of FDICIA, the FDIC might have saved as much as 59 percent of the resolution costs by acting in 1989. The closer to resolution that embedded losses occur, the greater the potential savings to be had from early closure. In the case of the second bank (Case 2 in Table C-3), the early closure rule would save only 5 percent of costs to the Bank Insurance Fund; losses were embedded long before the book-value measures showed signs of insolvency. In Case 3, the 1990 embedded losses are allowed to accumulate gradually from 1987 until 1990. Using the 2 percent closure rule of FDICIA, there are still savings that the FDIC could have achieved by resolving the bank in 1989: 13 percent compared with 1990 resolution costs.

Information on market values shows that the representative bank in Case 2 would have already been insolvent on the basis of its market value as early as 1987. If this bank had been closed using a market-value insolvency test, the FDIC could have avoided additional operating losses, dividend payments, and so on between 1987 and 1990. Resolution costs in 1987 would have been about $11 million, which represents a 33 percent savings for the fund over resolution costs realized in 1990. For the representative bank in Case 3, it would have been least costly based on market values if the FDIC had closed this bank during 1988. This estimate of savings assumes that there are reliable market-value measures. Although examiners can determine which banks are financially distressed, determining when a bank first becomes insolvent is very difficult because of the uncertainty of market-value estimates.

Using such a simple simulation model ignores the difficulties of monitoring and accurately predicting bank resolutions, but it illustrates the importance and potential cost savings if a weak bank is caught early enough in the process of deterioration.

Table C-1.
A Five-Year Profile of Some Average Financial Characteristics of Banks Resolved in 1990

	1986	1987	1988	1989	1990
			In Millions of 1990 Dollars		
Assets	93.6	94.4	90.2	80.1	73.7
Liabilities	87.5	89.1	86.5	79.3	73.7
Equity	5.2	4.7	3.4	0.7	0
Net Income	0.1	-0.6	-1.4	-2.7	n.a.
			In Percent		
Equity as a Percentage of Assets	6.5	5.6	4.1	0.9	0
Rate of Return on Equity	2.0	-12.0	-34.0	-352.0	n.a.

SOURCE: Congressional Budget Office analysis based on data provided by the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTES: Sample includes 140 banks resolved by the Federal Deposit Insurance Corporation in 1990. The banks making up this sample represent 83 percent of the resolutions in 1990. The remaining 17 percent were not included because of data limitations.

n.a. = not applicable.

Table C-2.
Resolution Costs and Estimated Embedded Losses Using Average Characteristics of 1990 Resolutions

Simulation Variables	Millions of 1990 Dollars
Resolution Cost	16.0
Book Value Assets at Resolution	73.7
Estimated Administrative Costs of Resolution[a]	7.4
Estimated Embedded Losses on Assets[b]	8.6
Estimated Market Value of Assets at Resolution[c]	65.1

SOURCE: Congressional Budget Office analysis based on data provided by the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTE: Average values are derived from a sample of 140 banks resolved by the Federal Deposit Insurance Corporation in 1990. The banks making up this sample represent 83 percent of the resolutions in 1990. The remaining 17 percent were not included because of data limitations.

a. Administrative costs are estimated as 10 percent of the book value of assets at resolution.

b. Embedded losses on assets equal resolution costs minus administrative costs.

c. Estimates of the market value of assets equal assets at book value minus embedded losses.

Table C-3.
Three Simulated Cases Involving Embedded Losses on Assets Using Average Characteristics of 1990 Resolutions (In millions of 1990 dollars)

	1986	1987	1988	1989	1990
Case 1. Asset Losses Embedded in 1990					
Estimated Market Value of Assets[a]	93.6	94.4	90.2	80.1	65.1
Estimated Market Value of Equity[b]	6.1	5.3	3.7	0.8	-8.6
Estimated Resolution Costs[c]	n.a.	n.a.	n.a.	6.6	16.0
Estimated Savings (Percent)	n.a.	n.a.	n.a.	59.0[d]	0
Case 2. Asset Losses Completely Embedded Starting in 1987					
Estimated Market Value of Assets[a]	93.6	85.8	81.6	71.5	65.1
Estimated Market Value of Equity[b]	6.1	-3.3	-4.9	-7.8	-8.6
Estimated Resolution Costs[c]	n.a.	10.7	12.3	15.2	16.0
Estimated Savings (Percent)	n.a.	33.0[e]	23.0[e]	5.0[d]	0
Case 3. Rising Embedded Asset Losses from 1987 to 1990					
Estimated Embedded Loss on Assets	0	2.5	5.0	7.4	8.6
Estimated Market Value of Assets[a]	93.6	91.9	85.2	72.7	65.1
Estimated Market Value of Equity[b]	6.1	2.8	-1.3	-6.6	-8.6
Estimated Resolution Costs[c]	n.a.	n.a.	8.7	14.0	16.0
Estimated Savings (Percent)	n.a.	n.a.	46.0[e]	13.0[d]	0
Memorandum:					
Value of Liabilities Used for All Cases	87.5	89.1	86.5	79.3	73.7

SOURCE: Congressional Budget Office analysis based on data provided by the Federal Deposit Insurance Corporation and W.C. Ferguson and Company.

NOTES: Administrative costs remain fixed at $7.4 million. The estimate of full embedded losses on assets is equal to $8.6 million; embedded losses remain constant at this amount except as stated in Case 3. This analysis assumes all liabilities are covered by deposit insurance.

Estimates are derived from average values of a sample of 140 banks resolved by the Federal Deposit Insurance Corporation in 1990. The banks making up this sample represent 83 percent of the resolutions in 1990. The remaining 17 percent were not included because of data limitations.

n.a. = not applicable.

a. Estimates of the market value of assets equal book value of assets minus embedded losses in each period.

b. Estimates of the market value of equity equal market value of assets minus liabilities.

c. Estimated resolution costs equal liabilities minus market value of assets plus administrative costs.

d. Savings in resolution cost if bank was closed using 2 percent capital threshold of the Federal Deposit Insurance Corporation Improvement Act of 1991.

e. Savings in resolution cost if bank was closed on the basis of market-value insolvency.

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