NBER WORKING PAPER SERIES

U.S. COMMERCIAL BANKING: TRENDS, CYCLES, AND POLICY

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Working Paper No. 4404

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 1993

NBER Working paper #4404
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ABSTRACT

This paper pinpoints sources of recent problems in U.S. commercial banking. The objective is to provide a context for evaluating policy options. There are three parts. The first documents how increased competition and financial innovation made banking less stable in the 1980s. The second part identifies the specific sources of the industry's difficulties over this decade. We find that the poor ex post performance by large banks provided the main stress on the system. From a variety of evidence, we conclude that this poor performance was the product of increased competition for the industry and a regulatory system that provides greater subsidies to risk-taking by large banks relative to the industry mean. The third part analyzes recent policy reforms and on-going policy options, in the light of our evidence on the main sources of problems in banking.

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"The business of banking ought to be simple; if it is hard, it is wrong."

Walter Bagehot (1873)

1. Introduction

According to a variety of commonly used indicators, U.S. commercial banking appears to be in both decline and distress. Figure 1 shows that the banking industry's share of the total amount of funds advanced in U.S. credit markets peaked in 1975 at 34%. It has dropped consistently since then, to 26% in 1991. Banks have lost ground to both open market sources of credit and nonbank intermediaries. Open market credit rose relative to all forms of intermediated credit during the 1980s; primarily responsible was the growth of the commercial paper and junk bond markets. Finance companies led the growth of nonbank intermediation over this period.

Another widely cited indicator of banking health is the failure rate. Bank failures averaged less than 2 per year in the 1970s. Table 1 shows that the failure rate jumped dramatically in the 1980s, averaging roughly 130 per year between 1982 and 1991. Accompanying the surge in the failure rate has been a rising number of banks in financial distress. Though the situation has improved recently, in late 1992 the Federal Deposit Insurance Corporation (FDIC) listed 909 U.S. banks with combined assets of $488 billion as "problem institutions." At the same time, regulators have been phasing in new requirements that mandate closure of banks that fail to meet a minimum standard of financial health.

It is true that after many years of dismal performance banks recorded substantial profits in 1992. But this news is not entirely comforting. Many believe that banks have benefited from an unusually steep yield curve by borrowing short and lending long. While the surge in profits has helped banks replenish their capital, the increased exposure to interest rate risk has discomforted many observers.[1]

The types of facts we have just reviewed are well known and are being widely discussed. They have instigated a new debate over bank regulatory policy. The original regulatory design, of course, was a response to the collapse of banking during the Great Depression. However, by starkly illustrating the efficiency cost of providing a public safety net, the savings and loan (S&L) debacle has heavily conditioned the current discussion. Another consideration is that the problems in banking emerged following a movement toward deregulation of

financial markets which began in the mid-1970s and escalated in the early 1980s. Though there is substantial debate over what direction new banking reforms should pursue, there is widespread agreement that the regulatory system did not keep pace with the changes in banking that occurred over the last 10 or 15 years.

In this paper we examine the important trends in banking and attempt to pinpoint the sources of problems. Our objective is to evaluate the key policy options. To provide a clear context for doing so, we first dig well beyond the surface facts just described to assess the nature and health of U.S. commercial banking.

Section 2 begins by documenting the important trends. We discuss why commercial banking has become less stable over time. We also document that banking has changed considerably, primarily through the growth of off-balance sheet activities. Thus, despite having a shrinking share of on-balance sheet assets, commercial banks remain vital to the general process of information-intensive lending and liquidity provision. This section also describes the origins of the too-big-to-fail doctrine, which we believe to be one of several key factors central to understanding the recent problems in banking.

Section 3 examines the general performance of banks over the last decade. It is well understood that banking problems have had a strong regional dimension. On the surface, this seems to suggest that historical restrictions on interstate banking may have been the key contributing regulatory distortion. We present a variety of evidence, however, which suggests that the main source of problems was increased risk-taking by large banks—banks that were relatively unconstrained by existing interstate restrictions. In particular, we show in a panel data study of individual bank behavior that, after the influence of regional factors is removed from the data, large banks performed much worse than the mean. From this and other evidence, we conclude that the poor ex post performance by large banks was a product of two factors: enhanced competition for the banking sector and a regulatory environment that encourages risk-taking by large banks.[2] In this spirit, we use our evidence on the differential performance across size classes of banks to compute a rough estimate of the impact of large banks' extra-normal loan loss performance on the industry aggregate and find that this impact was quite sizeable. We also present evidence that it was mainly large banks that were deficient of capital during the recent "capital crunch."

Section 4 provides an analysis of policy reform. We discuss both the recent legislation and other basic proposals that are on the table. For reasons we describe in the paper, the most vexing difficulty any policy must confront is the trade-off between safety and efficiency posed by the "Continental Illinois problem;" that is the appropriate choice of policies for large banks in financial distress.

2. *Trends in the Nature of U.S. Banking*

In this section, we trace the evolution of the important recent changes in banking. As a way to gauge the nature of these changes, we first examine the trends in the composition of bank assets and liabilities. We then examine the growth of off-balance sheet activities, which has been a significant way in which banks have evolved.

2.1 THE COMPOSITION OF BANK BALANCE SHEETS

2.1.1 Bank Assets Figure 2 portrays the relative behavior of the broad categories of bank assets over the postwar period. Most striking are the rise in the share allocated to loans and the decline in the shares allocated to securities and to cash and reserves. The drop in the latter reflects mainly a sequence of reductions in reserve requirements. An important reason for the secular decline in the security share was the development of money markets, such as the federal funds and large certificate of deposit (CD) markets. The increased access to short-term money permitted banks to reduce precautionary holdings of securities. Also, certain types of bank loans became increasingly liquid over time due to the advent of securitization and the development of markets for loan sales. Recently, the share of securities has been rising—partly due to the recession, partly due to the problems in banking and the associated regulatory changes, and partly due to banks exploiting the steepness of the yield curve.

Figure 3 disaggregates bank loans. The main categories are commercial and industrial (C&I) loans, mortgages, and consumer credit. Interestingly, the shares of each in bank loan portfolios were relatively stable from 1952 to about 1973. Since the mid-1970s, though, the share of C&I loans has declined, and the decline has been fairly precipitous since the early 1980s. One factor underlying this trend has been the growth of the commercial paper market, which largely involved a movement of high-quality C&I lending off bank balance

sheets. Another factor is the growth of nonbank intermediation, particularly finance company lending, as Figure 1 illustrates.

A less well-known factor underlying the relative decline in C&I loans is the recent growth of offshore commercial lending. While the flow of funds measure of C&I lending includes commercial lending both by domestic banks and by branches of foreign banks within the U.S. border, it underestimates loans to U.S. firms by banks located offshore.[3] The market for offshore lending grew rapidly during the 1980s. One likely factor, according to McCauley and Seth (1992), was that differences in reserve requirements on large CDs made intermediating (high-quality) loans cheaper offshore. Banks lending onshore were required to hold 3% reserves against large CDs; offshore banks faced no reserve requirements. Figure 4 illustrates the growth of offshore commercial loans. Somewhat surprisingly, offshore loans grew from 7% of total C&I lending in the United States in 1983 to more than 20% by 1991. Further, since the offshore banks are at some disadvantage in the evaluation and monitoring of small and medium-sized companies, the type of commercial loan business they absorbed was likely lending to larger, better-rated companies.[4]

The rise in offshore lending is symptomatic of the general increased importance of foreign banks to commercial lending in the United States. As Figure 4 indicates, foreign lending from both on- and offshore sources rose from 22% to 45% of C&I loans in the United States over the period 1983–91. One implication, of course, is increased competition for U.S. banks. Another is that regulatory policy must be designed from an international perspective.

While high-quality commercial lending moved off bank balance sheets to both domestic and foreign competition, the relative importance of mortgage lending grew. This phenomenon began in the mid-1970s and accelerated through the 1980s. Banks undoubtedly picked up some business from failing S&Ls, especially in the latter half of the 1980s. However, the shift to mortgage lending occurred well prior to the S&L debacle.

Disaggregating mortgage lending uncovers another important trend. As Figure 5 shows, commercial mortgage lending has accounted for much of the recent growth in overall bank mortgage lending.[5] In 1980, home mortgages accounted for about 60% of bank mortgage lending, and commercial lending accounted for about 30%. By 1990, the shares of the two types were about equal, each roughly 45% of overall bank

lending.[6] This phenomenon is of interest since a good fraction of the problems in banking stem from losses in commercial real estate lending, as we discuss later. In this context, it is important to note that the marked shift of banks from residential to commercial mortgages was not symptomatic of mortgage lending in general. Figure 6 shows that, for all financial intermediaries, the shares of aggregate mortgage lending going to the residential and commercial sectors have been relatively stable.

The movement of banks into commercial real estate reflects part of a broader trend in bank lending since the 1970s. High-quality assets such as securitized residential mortgages or commercial loans to highly rated firms move off bank balance sheets. In a fight to maintain market share, banks exploit their comparative advantage in information-intensive lending by moving into riskier, less liquid assets. Banks' comparative advantage stems partly from experience in evaluating and monitoring. It also stems partly from the nature of the regulatory system, particularly the nature of the public safety net. Later we return to these issues.

2.1.2 Bank Liabilities The flow of funds accounts divide bank liabilities into four categories: checkable deposits, small time and savings deposits, money market liabilities, and long-term debt. Figure 7 shows the long-term trends. There are two important patterns.

Perhaps the most obvious trend is the secular decline in the relative importance of checkable deposits, in favor of interest-bearing liabilities.[7] As late as 1960, nearly 60% of bank liabilities were checkable deposits and only about 30% were small time and savings deposits. The use of money market instruments and long-term debt was negligible. By 1990, checkable deposits were least important, less than 20% of total liabilities. Small time and savings deposits had climbed to 40%, while money market instruments and long-term debt each had climbed to around 20%.

The second important trend, which is closely related to the first, is the increased use of managed liabilities relative to deposits. Managed liabilities are short-term instruments which pay market-determined rates of interest. In contrast to deposits, which are relatively immobile in the short run, managed liabilities are highly interest-elastic. Managed liabilities permit banks to rapidly adjust their stock of loanable funds. Money market instruments are the prime example. There are two main types of money market liabilities (also known as *purchased money*): large time deposits and federal funds plus security repurchase agreements. The former

(large CDs) typically have maturities that vary from 90 days to a year, while the latter consist largely of overnight and weekly loans. The use of both types of instruments grew sharply in the early 1970s, as deregulation permitted the development of the money market.

Recently, banks also appear to be treating small CDs as managed liabilities. With deregulation of rates, small CDs have become increasingly sensitive to market forces. About two-thirds of small time and savings deposits are small CDs. Thus, if we include small CDs along with money market instruments in the measure, managed liabilities now constitute more than half of short-term bank obligations.

The increased use of managed liabilities, and of money market instruments in particular, has a number of important implications. One obvious implication is downward pressure on banks' net interest margins (the difference between the return per dollar on the asset portfolio and the interest cost per dollar of liabilities). Another is a rise in the interest sensitivity of bank liabilities. Now, in contrast to years past, an adverse movement in short-term rates may substantially raise banks' interest expenses. The development of the money market has also served to reduce the constraints of restrictions on interstate banking. The money market permits banks to cross state borders to obtain short-term funds (or, in the case of the money center banks, to cross international borders).

It is also true that the development of the money market has posed a vexing problem for regulators. In some ways, the failure of the regulatory system to appropriately adapt to the changes introduced by the money market planted the seeds for the problems the banking industry faces today. With the efficiency gains of the money market came the cost of increased exposure to liquidity risk. While textbook descriptions of bank runs still conjure up images of people rushing through the doors of depository institutions with passbooks in hand, the most likely source of a widespread banking collapse today would be a panic withdrawal of money market instruments. Since these instruments are typically in excess of $100,000, they are not covered by deposit insurance. For this reason, and because they are highly mobile funds, abrupt withdrawal is a possibility. The key point is that, in the current environment, the stability of the banking system—indeed, the stability of the overall financial system—is tied critically to the judgments of lenders in the money market.

Indeed, the most recent experience with a system-threatening run, the collapse of Continental Illinois in 1984, essentially involved a panic withdrawal by large CD holders. Rumors of insolvency precipitated the run on the money center bank, which had been funding roughly 90% of assets with purchased money (Hetzel 1991). As Greider (1987) described, the concern of both the Federal Reserve and the FDIC was that, if left unchecked, the Continental crisis could induce a systemwide collapse. Many of Continental's creditors were other banks. More generally, the regulators feared that losses by Continental's creditors might induce runs on a number of other large banks that had been weakened by the 1981–82 recession. It was this fear that induced the banking authorities to intervene in Continental and protect the uninsured creditors.

It was also an outcome of the Continental crisis that the banking authorities in the United States formally certified the policy of too-big-to-fail. The policy was implicitly in practice at least since the early 1970s, with the bailout of Franklin National (Boyd and Runkle 1993, Hetzel 1991, Isaac 1993). However, in September 1984, in the wake of the Continental intervention, the Comptroller of the Currency testified that eleven bank holding companies were too-big-to-fail. Further, in practice, the policy appears to have been extended in varying degrees to banks outside the top eleven. It is important to recognize that the doctrine refers loosely to a menu of policies that vary from lenient treatment at the discount window or in the valuation of assets to direct infusion of capital and protection of uninsured creditors.

Plugging one hole in the dike, however, opened up another. The too-big-to-fail policy, of course, indiscriminately subsidized risk-taking by large banks. At the same time, it created a nontechnological incentive for banks to become large.[8] Despite being a well-intentioned effort to protect against liquidity panics in the money market, the policy nonetheless helped create the climate for the current crisis.[9] We return to this issue repeatedly, since it is fundamental to the policy debate.

Finally, Figure 8 illustrates the secular behavior of the ratio of bank equity capital to assets. By definition, bank equity capital equals the difference between assets and liabilities. It specifically equals the sum of common and preferred stock outstanding and undistributed profits. Capital is important because it provides a buffer to absorb loan losses. Bank capital/asset ratios must satisfy minimum regulatory standards (currently in the process of change). From the early 1960s to the early 1980s, the aggregate capital/asset ratio dropped

by roughly a quarter, from around 8% to below 6%. The growth in banking assets afforded by the development of the money market (especially over the period 1962–74) was not matched by growth in bank equity.

Since the early 1980s, the aggregate capital/asset ratio has climbed on average. It is important to recognize, however, that this growth was largely a response to increased regulatory pressure in the wake of mounting bank and S&L failures and, relatedly, to new capital standards which were phased in over the last five years (which we discuss later). Much of the growth in this ratio also reflected a contraction in the denominator: assets. Because of the kinds of informational asymmetries stressed by Myers and Majluf (1984), issuing new equity is expensive for banks. Banks typically use retained earnings to build equity (Baer and McElravey 1993). As a number of studies have indicated (Bernanke and Lown 1991, Peek and Rosengren 1992), meeting capital requirements in recent years has forced many banks to contract asset growth.

2.1.3 The Relation Between Asset Size and Balance Sheet Composition The aggregate balance sheets mask some important differences across size classes of banks. Generally speaking, smaller banks adopt more conservative asset and liability positions than do large banks. An important policy issue is whether these differences are due to technological factors or to a regulatory environment that favors large banks.

Following the convention of the *Federal Reserve Bulletin*, we divide banks by assets into four size classes: small (those with assets less than $300 million), medium ($300 million - $5 billion), large (greater than $5 billion), and large and money center (the 10 largest). Figure 9 shows the portfolio composition of interest-bearing assets for each of these size classes. The data are based on averages over the five-year period, 1987–91. The percentage of loans in the asset portfolio varies positively with size, ranging from 59% for small banks to 72% for the money center banks. Conversely, the percentage of security holdings varies negatively: from 31% for small banks to 10% for the money centers.

Figure 10 disaggregates loans by bank size. The share of loans allocated to business lending—the sum of C&I and commercial real estate lending—varies positively with size. Both the consumer and residential real estate shares vary negatively. Since business lending generally accounts for the substantial majority of loan losses, the general picture, then, is that larger institutions hold riskier asset positions. Later we will present some information on loan performance that is consistent with this contention.

Figure 11 characterizes the composition of liabilities. The key point here is that the relative use of core deposits (transaction and savings and time deposits) shrinks with size, while the relative use of money market instruments increases. Nearly 90% of small bank liabilities are core deposits. Conversely, money market instruments constitute roughly 42% of large bank liabilities and 54% of money center bank liabilities. Further, the money center banks obtain more than half of their purchased funds from abroad. (Deposits in foreign offices are mainly money market instruments.) An implication of the differences in liability structures is that larger banks have thinner net interest margins. As Figure 13 illustrates, the net interest margin varies from 3.9% for small banks to 2.8% for the money centers.

In addition to holding riskier asset portfolios and employing greater use of money market instruments, larger banks have lower capital/asset ratios, as Figure 12 shows. Indeed, large banks were responsible for much of the secular thinning of the capital/asset ratio portrayed in Figure 8. Again, a key policy question is, Why? Does this reflect some kind of technological advantage: e.g., a better ability to diversify risks or scale economies in loan processing?[10] Or does it instead reflect mainly the effect of regulatory bias induced at least in part by a too-big-to-fail policy? We return to this issue later with an assessment of the performance of banks across size classes.

2.2 THE GROWTH OF OFF-BALANCE SHEET ACTIVITIES

In recent times, commercial banks have changed considerably the way they do business. To a large extent, these changes have involved moving traditional activities off the balance sheet. A simple but common example is the issuance of a *standby letter of credit*. With this arrangement, a bank guarantees a loan made by some third party, instead of actually funding the loan itself. The loan does not appear on the asset side of the bank's balance sheet; however, its contingent liability is essentially the same as if it did.

Figure 14 provides some indication of the rise in the relative importance of off-balance sheet activities. Fee income (income from off-balance sheet activities) as a percentage of total bank assets doubled between 1979 and 1991, from 0.75% to more than 1.5%.[11] At the same time, fee income as a percentage of total income before operating costs (the sum of fee income and net interest income) rose from about 20% to about 33%.

Further, the relative importance of off-balance sheet activities varies positively with bank size. Figure 13 indicates that for the money center banks, fee income is about 40% of total income before operating costs.

For several reasons, it is important to account for off-balance sheet activities. First, the unadjusted balance sheet numbers overstate the decline in bank activity. A good fraction of the relative drop in bank assets simply reflects an unbundling of the traditional functions involved in intermediating loans, not banks vanishing from the scene. As we discuss, banks remain important for originating information-intensive lending, though the fraction of loans they keep on their balance sheets after origination has been diminishing. Perhaps more significant from a policy standpoint, banks remain extremely important in providing short-term loans to meet working capital needs, i.e., in providing liquidity for businesses. Commercial banks remain involved in virtually all short-term working capital lending, either directly or indirectly through off-balance sheet activity, as we discuss. A banking crisis could have serious ramifications for the flow of short-term business liquidity (Corrigan 1983, 1991).

A second and closely related reason for examining the off-balance sheet numbers is that most off-balance sheet activities entail some degree of risk. Opinion is divided on the degree of risk exposure, and making a firm judgment requires maneuvering through uncharted territory. Nonetheless, regulators have recently extended capital requirements to banks' off-balance sheet assets. Any policy discussion now requires an understanding and assessment of off-balance sheet activities.

There are three basic types of off-balance sheet activities: loan commitments and standby letters of credit, loan sales and securitization, and provision of derivative instruments (e.g., swaps). We describe each in turn and offer a rough assessment of its relative importance.

2.2.1 Loan Commitments and Standby Letters of Credit Most commercial bank lending now is done on a commitment basis. Firms anticipating needs for funds will arrange for a *loan commitment*, which is essentially a line of credit. In addition to using commitments to fund planned investments, firms also use credit lines as a form of precautionary liquidity (Avery and Berger 1991a). In times when there is a general scramble for liquidity, such as the onset of recessions when firms must finance unsold inventories and hoarded labor, banks can expect firms to draw down their credit lines. A commitment is thus a liquid claim on a bank, similar in

spirit to a deposit claim. It follows that commitments impose a certain degree of liquidity risk on banks, as do deposits.

As discussed earlier, a *standby letter of credit* is a guarantee made by a bank for a loan extended by a third party. In this way, it is an indirect vehicle through which a bank provides a borrower with liquidity. To indicate the general importance of standby letters of credit and commitments, Figure 15 plots the recent behavior of the stock of each instrument outstanding relative to C&I lending. The ratio of standby letters of credit to C&I lending was about 20% over the period 1983-91. The ratio of commitments to C&I lending rose from 74% in 1983 to 90% in 1991.

Part of the relative growth in commitments over this period was due to the rapid development of the commercial paper market. As an outgrowth of the Penn Central crisis in 1974, virtually all commercial paper issuers must secure their loans with backup lines of credit from banks.[12] Viewed in this light, commercial paper issued by a nonfinancial company may be thought of as a C&I loan that is taken off the bank's balance sheet. The bank provides its services to the commercial paper borrower by issuing a backup line of credit and earns a fee for so doing. Because the borrower is sufficiently creditworthy (and indeed has been certified by the bank issuing the credit line), nonbanks are willing to hold the paper. But the bank remains in the picture, since the firm issuing commercial paper may have to draw on its credit line in order to meet the obligation on its paper.

The ratio of nonfinancial commercial paper to C&I loans has increased rapidly in recent years, going from less than 5% in 1969 to over 15% in 1991. The firms moving into the paper market were typically large, highly rated companies. Thus, instead of directly providing loans to these firms, banks switched to indirectly supporting loans to these companies by offering backup lines of credit. In this way, the growth of the nonfinancial commercial paper issues represents the movement of a component of lending, a high-quality component in particular, off the banks' balance sheet.

Through a similar mechanism, banks are also involved in supporting lending by finance companies. A recent study by D'Arista and Schlesinger (1992) has documented that 90% of the commercial paper issued

by the 15 largest finance companies is backed by a bank line of credit or some other form of bank guarantee (such as a standby letter of credit).

An important corollary implication is that banks remain vitally important to the provision of short-term working capital finance. C&I loans, nonfinancial commercial paper, and finance company loans account for virtually all the short-term business finance in the United States. Thus, either directly or indirectly, commercial banks remain vital to the flow of business liquidity.

2.2.2 *Loan Sales and Securitization* Another important recent development is the sale of loans that banks initiate. For example, a firm might come to a bank for a long-term loan to finance capital equipment. The bank provides the necessary evaluation and designs the terms and covenants. After earning a fee, it sells the loan, often in the form of a private placement, to another intermediary, possibly an insurance company. If the bank retains no explicit liability (i.e., if the loan is sold *without recourse*), the loan is removed from the bank's balance sheet.

Though loan sales have grown over time, it is important to recognize that a good fraction of bank loans are not sufficiently liquid to be sold on secondary markets. Figure 15 also presents some information on the recent behavior of commercial loan sales relative to total C&I lending. The ratio of commercial loan sales to C&I loans grew rapidly in the latter half of the 1980s, from about 10% in 1986 to more than 30% in 1989. This phenomenon parallels the surge in junk bond financing over this period. Notably, commercial loan sales, along with junk bond financing, seem to have shrunk in relative importance over the last several years. In 1991, the ratio of loan sales to C&I lending was back down to 10%. Thus, while banks do sell some commercial loans, it would be incorrect to infer that most of their commercial assets are sufficiently liquid to be sold and valued on secondary markets.

A phenomenon closely related to loan sales is securitization. *Securitization* involves pooling a large number of loans with fairly uniform features and repackaging them as asset-backed instruments which may be sold on secondary markets. Candidate types of loans for securitization have fairly homogeneous features, are reasonably well collateralized, and do not require intensive monitoring. Examples include residential mortgages, automobile loans, and credit card balances. Unfortunately, there are no good aggregate data which trace the

extent of this activity back to the originating banks. Though innovation in this area is continuing, securitization is still not a common practice for highly idiosyncratic, information-intensive commercial loans.

2.2.3 Derivative Instruments Provision of derivative instruments is the most rapidly growing off-balance sheet activity—and the least understood. *Derivative securities* involve trading of risks on existing securities. A common example is an interest rate *swap* in which two parties exchange sequences of interest payments. For example, in a "plain vanilla swap," a fixed-rate commitment is exchanged for a floating-rate commitment. Swaps often involve different currencies: for example, exchanging a U.S. dollar–denominated sequence of interest payments for one denominated in deutsche marks. Indeed, the use of interest rate swaps is believed to have originated in the Eurobond market in 1981. In addition to interest rate and currency swaps, banks now trade a number of derivative securities based on swaps: for example, "swaptions," "caps," and "collars."

Derivatives are often intermediated through brokers, and large commercial banks are some of the largest brokers in this market. Brokers, including commercial banks, do not always fully net (i.e., hedge) their positions. Acting as a swap broker thus often entails risk-taking.

Some regulators, most notably E. Gerald Corrigan (1991), have expressed grave concerns about the risk exposure of commercial banks operating in the swaps and derivatives markets. The markets are largely unregulated, and new securities continue to be developed at a rapid pace. To provide some idea of the size of the market, Greenbaum and Thakor (1992) estimate that in the fourth quarter of 1989, commercial banks held gross swap positions of over $500 billion. The gross swap position, however, is simply a measure of the principal amount on the security underlying the traded interest payment streams. It therefore does not meaningfully measure a bank's net risk exposure. Unfortunately, even among market participants, there is a general lack of agreement over how to quantify risk exposure, especially for the more exotic instruments. As a consequence, there are few, if any, aggregate indicators that are useful to guide thinking about this issue.

Regulators seem mainly concerned that derivatives activity in the United States is concentrated among seven large commercial banks. The fear is that losses on derivatives trading could force the failure of one of these large institutions, which would send shock waves not only through the derivatives markets, but also through money and exchange rate markets to which derivatives trading is closely linked through complex

arbitrage strategies (Phillips 1992). In the absence of any reliable data, it is difficult to assess these arguments. Nonetheless, this clearly seems to be an issue deserving of more attention.

2.2.4 Credit Equivalents of Off-Balance Sheet Activities The new Bank of International Standards (BIS) capital standards explicitly recognize the importance of off-balance sheet activities for risk exposure. They require that off-balance sheet commitments be transformed into *credit equivalents* for the purpose of setting capital requirements against these activities. The procedures for doing this are quite complicated and have been developed by the Federal Reserve System and other central banks over a period of several years. What we do here is to simply take the credit equivalent total for each bank and compute the aggregate. Doing so provides some feel for the aggregate importance of off-balance sheet activities and for the risk exposure they entail.

The Federal Reserve's Board of Governors provided us with the off-balance sheet data. The computer program which does the actual computation of credit equivalents is in Berger and Udell (forthcoming). The earliest year for which data are available is 1983. Although a large number of off-balance sheet activities are included in these computations (for example, foreign exchange, future, option, and swap positions), about 90% of the total credit equivalents result from two off-balance sheet items: standby letters of credit and loan commitments.[13] Figure 16 shows the ratio of off-balance sheet credit equivalents to C&I loans, computed quarterly over the period 1983–91 with the Berger–Udell procedure. Figure 16 also shows that off-balance sheet activities, in terms of the credit equivalents, now represent a substantial fraction of bank assets, roughly equal to half of C&I lending.

To summarize, increased competition and financial innovation have induced (i) a movement of liquid high-quality assets off bank balance sheets in favor of less liquid assets such as commercial real estate loans and (ii) an increased engagement in off-balance sheet activities. Further, there is a strong correlation between size and portfolio structure with large banks appearing to adopt a riskier portfolio stance.

3. Recent Performance

In this section, we pinpoint the sources underlying the bleak performance of banks in recent years. We begin by presenting a set of aggregate measures of bank performance. We then turn to an analysis of disaggregated

data. The goal here is to sort out the relative importance of regional factors versus risk-taking by large banks as determinants of the industry's poor overall performance.

3.1 AGGREGATE PERFORMANCE MEASURES

Figure 17 presents the trend in two commonly used measures of bank profitability: the rate of return on equity and the rate of return on assets. Both measures exhibit similar behavior over the period 1973–91. Both decline fairly steadily after 1979. The exception (for both measures) is a sharp drop in 1987 followed by a recovery in 1988. However, the plunge in 1987 reflects large write-offs of international loans, the timing of which was somewhat arbitrary. The main point of Figure 17 is that after trending down since 1979, bank profitability in the latter half of the 1980s was significantly below its average for most of the 1970s. The rate of return on equity dropped from about 14% in 1979 to an average of about 8% over 1989–91. Similarly, the rate of return on assets dropped from about 0.75% to 0.5%. Indeed, bank profitability was lower over the last several years than during the severe 1981–82 recession.

Figure 18 shows that a rise in the rate of loan losses accompanied the general decline in profitability. Provisions for loan losses increased during the 1981–82 recession, as would normally be the case in a downturn. However, the upward trend in these provisions continued through the 1980s. The loan loss rate rose from about 0.2% of assets in the late 1970s to nearly 1% of assets over the last several years. Conversely, the net interest margin actually rose slightly over this period, from about 3.3% in 1977 to 3.8% in the mid-1980s to an average of about 3.6% over the last several years. The aggregate measures thus suggest that the decline in bank profitability stemmed from loan losses rather than from a shrinking net interest margin. Why didn't the net interest margin drop over this period, despite increased competition and deregulation of interest rates on bank liabilities? In our view, the slight upward trend of the net interest margin is symptomatic of the decline in bank asset quality over the period. That is, the rise in the aggregate loan spread likely reflects the decline in the asset quality mix over the period. The sharp rise in loan losses over the period also fits the general story. In the next several subsections, we bring more evidence to bear on this issue.

3.2 SIZE AND REGIONAL EFFECTS IN BANK PERFORMANCE: DESCRIPTIVE EVIDENCE

It is first useful to provide some background on the cross-sectional distribution of banks by size and region. We divide banks into six asset-size categories based roughly on the classifications used by the FDIC. The asset-size categories range from less than $50 million to more than $10 billion. Figure 19 presents information on the percentage of banks and the percentage of bank assets across the six size classes, based on averages constructed over the period 1983–91. Clearly, though there are many banks in the United States, bank assets are concentrated among a relatively tiny percentage. Banks with more than $10 billion in assets constitute only 0.3% of the total number; however, they held 37.4% of aggregate bank assets on average over the nine-year sample. Banks with more than $1 billion in assets numbered 2.5% of the total, but held about two-thirds of overall assets. At the other extreme, nearly 80% of the banks had less than $100 million in assets, but these banks in total only held about 13% of the total. Figure 20 similarly portrays the distribution of banks across census regions. In NBER terms, large banks tend to be located near salt water (East and West Coasts), while small banks tend to concentrate around fresh water.

Table 1 presents evidence on bank failures disaggregated by census region. Over the period 1980–91, 1,351 banks failed. The peak was the five-year interval 1986–90, when 70% of the failures occurred. Not surprisingly, there is a strong regional pattern that is closely associated with the temporal pattern of certain regional economic difficulties. The (West South Central) oil states, principally Texas, accounted for the majority of failures: nearly 700. These failures are bunched during 1986–90, roughly the period when oil and real estate prices collapsed in this region. A distant second in importance are the (West North Central) agricultural states. Agricultural problems in this region during the mid-1980s precipitated nearly 200 bank failures.

For two related reasons, however, the raw failure numbers portray an incomplete picture. First, these numbers do not take into account the size of failed banks. While small bank failures are far more plentiful, a large bank failure places far greater pressure on the FDIC insurance fund. Despite the rash of failures in the agricultural states, for example, the assets of closed banks never exceeded 1% of the total in the region, since virtually all of the banks involved were small. Similarly, despite there being only 12 bank failures in New

England in 1991, assets of failed banks amounted to 8.8% of the regional total. Table 2 confirms the general point. It shows that in the peak period of 1986–90, banks with assets more than $500 million accounted for less than 4% of total bank failures, but nearly 60% of the total assets of failed banks. Further, the three banks with assets more than $5 billion that failed accounted for more than 30% of the total failed-bank assets. A second reason the failure data are misleading is that they do not take into account the historical regulatory bias in favor of large banks. Because the FDIC has been less willing to close large banks, the failure numbers do not accurately capture overall bank performance.

The biases inherent in using failure data as indicators of bank performance lead us to consider several finer measures. Figures 21 and 22 report, by census region, the ratios of loan loss provisions to assets and net income to assets, respectively. The numbers are averages across individual banks within the respective region over the period 1983–91. By both indicators, the banks in the West North Central region (which includes Texas) performed worst. Both figures suggest, however, that regional considerations alone do not provide a complete story. In the troubled New England region, for example, banks on average performed at the national mean in terms of loan loss provisions and only slightly below the national mean in terms of net income. Similarly, the poor performance of the money center banks located in the Middle Atlantic region was at variance with other banks there, which performed above the national mean on average.

Splitting the data by size yields a clearer picture. Figure 23 reports the ratio of loan loss provisions to assets across the six size classes of banks, and Figure 24 reports the ratio of net income to assets. Across size classes, there is a U-shaped pattern to loan loss provisions. Banks in the largest category (more than $10 billion in assets) performed worst by this measure. The ratio of provisions to assets declines with size, reaching a minimum at the class of banks between $100 million and $250 million in assets. The ratio then begins to rise monotonically as size declines further.

Net income to assets is of course a better overall indicator of performance than is provisions to assets. However, the U-shaped pattern of the latter is simply mirrored by a hump-shaped pattern of the former, as Figure 24 illustrates. Gauged by net income to assets, banks larger than $10 billion still perform least well, and banks between $100 million and $250 million still perform best.

Judging from Figures 23 and 24, we see that relative loan loss performance influences the pattern of net income to assets across size classes. Losses on loans to less-developed countries (LDC loans) were likely an important factor since these losses were heavily concentrated among large banks. Perhaps less well known is that large banks also suffered disproportionately from commercial real estate lending. We know from the previous section that the fraction of commercial real estate loans in bank portfolios varied positively with size. However, even within the category of commercial real estate lending, large banks performed less well. Table 3 shows that in the third quarter of 1992, the percentage of noncurrent, or "problem," real estate loans ranged from 1.6% for the smallest banks to 7% for the largest banks. In every case, business-related real estate lending—"construction" and "commercial"—accounted for most of the noncurrent loans, but the share within each category rises steeply with bank size. Astonishingly, 21% of construction loans at the largest banks are noncurrent.

From a policy perspective, it is important to determine how well the negative correlation between size and performance survives, once we control for region. For example, there is a regional dimension as well as a size dimension to commercial real estate problems. Table 4 shows that noncurrent real estate loans are heavily concentrated in the North-East and the West, the two main areas where real estate problems linger. Thus, it is possible that the correlation between size and performance of the real estate loans is simply due to the fact that the banks in the troubled North-East and West are larger on average. If this is the case, then restrictions on interstate banking might be primarily responsible for the disproportionate concentration of loan losses. If the negative correlation between size and performance remains after controlling for location, then it is possible that distortions induced by a too-big-to-fail safety-net policy may have been important.

3.3 SIZE AND REGIONAL EFFECTS IN BANK PERFORMANCE: FORMAL EVIDENCE

We now investigate the relation between performance and size, after controlling for the influence of region. The data set we employ contains annual observations on individual banks over the period 1983-91.[14] The sample is obtained from the FDIC's call report and contains the universe of domestic insured commercial banks over this period.

We consider two performance measures: the ratios of net loan charge-offs to assets and net income to assets.[15] Each, of course, is a measure of ex post performance. Our working hypothesis, particularly for interpreting the behavior of charge-offs, is that over the sample period a poor ex post performance is the consequence of a high degree of ex ante risk-taking.[16] The idea is that during the 1980s there was a series of large negative shocks (as Figures 17 and 18 suggest) to the banking system and that by examining ex post returns we are getting some feel for the outer tales of the respective distributions.

For each bank, we average each of the two performance indicators over the sample period. We work with the time-averaged values of these indicators for several reasons. First, the timing of charge-offs and income is to some degree arbitrary in the short run. Because clean market value assessments of the overall portfolio are unavailable, banks have some short-run discretion over when they report gains and losses. Over time, the discrepancy between accounting and market value indicators declines. Second, working with time-averaged data permits a more parsimonious representation of a model. In general, bank performance should vary over time with economic conditions. However, since we are mainly interested in uncovering secular relationships, it seems reasonable to average out the time effects: the benefit is a much simpler model to evaluate.

At least two types of bias are possible. First, some banks drop out of the sample over time. Since exit is most often due to failure, exit and performance are likely correlated. Omitting exiting banks from the sample could therefore bias the estimates. We adjust for this problem by averaging each of the performance indicators for a bank over its lifetime in the sample, even if the bank exits partway through the sample period. In this simple way we include information from the exiting banks in our estimates.

The second possible bias is that bank performance could feed back and affect size. If a bank does not perform well, for example, it may decide to contract its assets. We address this issue by using presample data to sort banks. Thus, we use the 1983 data (see Appendix) to sort banks into size groups as well as into regions. The performance indicators we use as dependent variables are then time-averaged over 1984–91. For robustness, we also split the sample and work with time averages of the performance variables over 1987–91. In this latter case, we use 1986 data to sort the banks.

The initial set of independent variables are dummies for census region and for size. We use the six size classes defined earlier (in Figure 19). For several reasons, we use discrete indicators rather than a continuous variable for size. First, the earlier descriptive analysis suggests that the relationship between performance and size is likely to be highly nonlinear. Second, by using size class indicators which correspond closely to the categories the FDIC uses to report all types of bank data, we directly link our results with a variety of other types of information on bank performance. A similar consideration motivates the use of census regions to denote location: the FDIC uses this indicator to present information on performance across locations.

Let D_j^r denote a dummy for region j, D_k^s a size dummy for size class k, and x_{ijk} the time-averaged value of a bank performance indicator. Then the basic model we estimate is given by

$$x_{ijk} = a_j D_j^r + b_k D_k^s + \epsilon_{ijk} \tag{1}$$

where ϵ_{ijk} is a random error term and where, to identify the model, one of the coefficients on the six size class dummies is normalized at zero. We model bank performance as a linear function of a region-specific intercept, a_j, and a slope coefficient, b_k, that depends on the size class of the bank. Under the initial formalization given by equation (1), we restrict the slope coefficient on size class to be identical across regions. We also consider a more general formulation that permits the size class slope coefficients to vary across regions, as given by

$$x_{ijk} = a_j D_j^r + b_{jk} D_k^s \cdot D_j^r + \epsilon_{ijk}. \tag{2}$$

Here the slope coefficient on size, b_{jk}, is region-specific.

Under the null hypothesis that size is unimportant to performance, the slope coefficients on size equal zero for each size class. If the null is true, then restrictions on interstate banking may be paramount in explaining bank performance. Roughly speaking, if the region dummies capture all the explanatory power, then it is likely that constraints on the banks' ability to diversify nationally have inhibited banking. But, if the too-big-to-fail policy has been a significant distortion (in the context of significant competitive pressures on banking and managerial entrenchment problems for large banks), then we should expect to reject the null. Further, after controlling for regional effects, we should expect an inverse connection between performance and size, especially at the upper tail of the size distribution.

Table 5 reports the results from estimating the basic model, described by equation (1). There are four regressions, corresponding to two different dependent variables (the ratios of net charge-offs to assets and net income to assets) and two different sample periods (1984–91 and 1987–91).[17] We normalize at zero the coefficient on the banks in size class 3 ($100 million - $250 million in assets). In each case, we easily reject the null that size class is unimportant. Further, to a first approximation, both the U-shaped pattern of loan losses and the hump-shaped pattern of net income across size classes that appeared earlier in Figures 23 and 24 remain after we control for the influence of region.

For net charge-offs, the coefficients on the size dummies increase monotonically, moving from size class 3 up to size class 6 (more than $10 billion in assets).[18] Further, this ordering of coefficients is statistically significant, as Table 6 indicates. An analogous set of results arises when the dependent variable is instead net income to assets.[19]

It is also interesting to observe that the smallest size banks (class 1, those with less than $50 million in assets) performed less well than the next two larger classes. The difference, however, is sharper on average with net income to assets than with net charge-offs to assets. One interpretation is that the smallest size banks do not exploit scale economies that seem available at least up to the size 3 category.

We next turn to the more flexible model described by equation (2), which permits the slope coefficient on size to vary across regions. Table 7 reports the coefficients on each size class averaged across regions, with the averages weighted by the percentage of banks in the size class of interest that are in the respective region. The table also reports the joint significance of a size class dummy across regions for each size class. The results from the general model correspond to those from the restricted one. Once again, both the U-shaped pattern for net charge-offs and the hump-shaped pattern for net income emerge, and both are highly significant. Analogously to Table 6, Table 8 presents tests of the equality of coefficients on adjacent size classes within a region, jointly across all regions. The message of Table 6 is preserved: between size classes 3 and 6, the inverse ordering between size and performance is significant, and the smallest size class of banks performs poorly relative to the two next-larger ones.

We know from the previous section that asset structure, as defined by broad categories of loans, varies systematically with size. Does the relation between size and performance operate through these differences in broad categories of lending? That is, have large banks performed less well mainly because they have invested more heavily in C&I and commercial real estate lending? We address this issue by adding to the basic model [equation (1)] two loan share variables: the ratio of C&I loans to total loans and the ratio of commercial real estate loans to total loans. In each case, we use the presample value of the share variable to minimize the problem of simultaneity.

Tables 9 and 10 show that the explanatory power of the size dummies remains after including the asset share variables. This is true for both net charge-offs and net income and over both the 1984–91 and 1987–91 sample periods. The share variables are generally significant, with signs as expected. However, they do not displace the size effect. The size dummies exhibit the same pattern and generally the same levels of significance as in the basic case. These results suggest that even within broad categories of loans, large banks tended to take greater risk. They are compatible with the informal evidence in Table 4 which showed that even within similar categories of commercial real estate lending, the large banks fared far worse than the average. Also, owing to the concentration of LDC lending, large bank C&I portfolios were riskier.

A question that remains is whether the abnormal risk-taking by large banks could be explained by factors completely unrelated to regulatory policy (i.e., the subsidy inherent in the too-big-to-fail policy). Could it be the case that for technological reasons large banks have simply specialized in different types of loans than smaller banks and that the large banks have just been unlucky? We are skeptical of this hypothesis providing a complete explanation, for a variety of reasons. The largest category of banks (those with assets more than $10 billion) performed significantly worse than the next-largest (from $1 billion to $10 billion). It is hard to believe that important differences in scale economies exist between these two kinds of banks that permit the former to make loans the latter cannot. In addition, the banks in the next size class down, from $250 million to $1 billion, are still reasonably large and thus still relatively unrestricted in the types of loans they can make.[20] A pure technological story also has difficulty explaining why the large banks adopted a riskier liability structure as well as a riskier asset structure. As we documented earlier (in Figures 11 and 12), the large banks

operated with both thin equity capital-to-assets ratios and thin net interest margins, in the latter instance owing to the extensive use of purchased money. It is worth emphasizing that large bank capital/asset ratios were not only low relative to the industry mean, but were also substantially lower than those held by competing nonbank intermediaries such as finance and life insurance companies (Boyd and Rolnick 1989). A natural explanation is that that policy led to the mispricing of the (technically) uninsured liabilities of these institutions.[21]

We next conduct a simple experiment to determine the quantitative importance of the poor relative performance by large banks. We compute the reduction in total loan losses that would have resulted if the two largest categories of banks (classes 5 and 6) had performed as well as the third-largest category (class 4). Specifically, for each year and each region, we compute values of net charge-offs for the class 5 and 6 banks, assuming that they had the same net charge-off/asset ratio as the class 4 banks in the respective region.[22] We then use this information to compute the yearly reduction in aggregate charge-offs that would have resulted. If the extra-normal loan losses of the class 5 and 6 banks reflect the consequences of excessive risk-taking encouraged by regulatory policy, then this computation is a rough estimate of the cost of this policy.

Table 11 shows that under these assumptions total charge-offs would have averaged about 25% lower over 1983–91. This amounts to an extra loss in wealth over the period of $45 billion—if not quite an Okun gap, then certainly a heap of Harberger triangles. To place the number in context, the total equity capital of the banking system (charge-offs ultimately reduce capital) is $232 billion. It is worth emphasizing that the class 6 banks (those with assets over $10 billion) account for the lion's share of the cost. Finally, we observe that two-thirds of the cost—about $30 billion—arises in the peak period of banking difficulties, 1988–91, mainly due to the poor performance of the class 6 banks.

Our cost estimate is conservative, we think, for several reasons. First, we did not use the best performing banks, class 3, as the benchmark for calculating the cost. Using the size class 3 banks ($100 million - $250 million) as the benchmark for performance instead of the size class 4 ($250 million - $1 billion) would produce a larger estimate.

Second, to the extent that loan losses forced capital constraints to bind tighter, the shadow value of charge-offs may exceed the dollar amount. Table 12 presents information by size class on the fraction of assets

held by banks that were capital-constrained during the height of the "capital crunch"—in 1990 and 1991. The table shows that the capital crunch was almost exclusively a large bank problem. It was mainly large banks that were constrained, and large banks accounted for the vast majority of assets held by constrained banks.[23] These facts correspond to the recent empirical evidence on the impact of bank capital on loan growth during 1990 and 1991. Both Peek and Rosengren (1992) and Furlong (1991) showed that the link between capital declines and loan growth (first documented by Bernanke and Lown 1991) was stronger in magnitude for large banks than for small banks. Thus, to the degree loan losses forced a reduction in lending (via the impact on bank equity), our cost estimate should be adjusted upward.

Our calculations are only intended to question the efficiency of the safety net that existed in the 1980s and not whether a safety net is desirable. As discussed in Section 2, despite the changes in this industry, a major banking crisis could still potentially disrupt the economy. As Summers (1991) observed, a financial crisis which raised the unemployment rate by a percentage point for a year would result in a $100 billion loss in output. We expand on the general issue of the safety net in the next section.

4. Policy

We now analyze policy reforms in banking, including both reforms that have been recently implemented and those that remain under active debate. Our assessment is that the regulatory changes, though less than ideal, work toward mitigating the main adverse incentive effects of the old regime. Further, we find that the banking industry's recent complaints about overregulation are difficult to substantiate formally. We do think, however, that after a transition period which permits banks to improve their equity capital base, further evolutionary changes would be beneficial. It might be desirable, for example, to reduce some of the regulatory burden on banks (particularly regulations which micro-manage lending) in return for a moderate scaling back of the federal safety net.

4.1 RECENT REFORMS

In the late 1980s, it became apparent that reform of the banking industry's regulatory/insurance structure was badly needed. The issue could not be ignored, given both the S&L crisis and the mounting loan losses of

commercial banks, documented earlier in this study. In addition, the rising share of domestic commercial lending by foreign banks (seen in Figure 4) and the large share of foreign loans in U.S. bank portfolios made regulators realize that banking had become increasingly an international business. The need to coordinate policy across borders became clear.

At the time, a variety of reform proposals were debated, including 100% reserve (narrow) banking, prompt closure of troubled banks, reduced deposit insurance (or coinsurance), market value accounting, risk-based insurance premia (or capital requirements), and reduced restrictions on interstate banking. Two major policy responses emerged from the debate: the BIS capital standards and the FDIC Improvement Act (FDICIA). We consider each below.

The Basle Accord of 1988 introduced the BIS capital standards. The objective was to harmonize regulations on banks that did business across international borders. The standards require that, by December 1992, banks involved in international finance have capital equal to 8% of a (crude) risk-weighted measure of assets. Included in the measure of assets are adjustments for off-balance sheet activities. There are also plans to extend the BIS standards to interest rate risk.

The FDICIA was entirely an initiative by the regulatory authorities in the United States. Generally speaking, it imposes tougher requirements on U.S. banks than those enacted under the Basle Accord. Regulatory implementation of FDICIA extended the BIS standards to all U.S. banks, not just those involved in international lending. It also requires prompt closure of problem banks, regulatory constraints tied to tier capital standards (beyond those in the BIS standards), and tougher supervision and regulation. It also requires the implementation of risk-sensitive insurance premia no later than January 1, 1994.

Other provisions of the FDICIA attempt to roll back the too-big-to-fail policy. Saving a large U.S. bank now requires the formal concurrence of bank regulators, the Secretary of the Treasury, and even the President. These provisions also restrict discount window lending, a favorite tool over the last decade for keeping large banks afloat.[24] Finally and importantly, the provisions impose restrictions on interbank lending to banks that fail to meet adequate capital levels. The goal here is to reduce the likelihood that closing a large bank will precipitate a wave of failures throughout the banking system. The idea is to avoid the kind of trap regulators

fell into during the Continental Illinois crisis. The policy will increase regulators' ability to commit to a policy of closing large banks that perform poorly.

It is difficult to evaluate the new policy package since it is recently implemented. Nonetheless, the reforms appear to directly confront what our analysis suggests has been the main problem with the existing regulatory system: the subsidy to risk-taking by large banks. As we have argued, an important way the subsidy has played out is large banks' holding less capital than they might have otherwise. The new capital requirements offset this distortion. In this way, they force the large banks to better internalize the costs of their portfolio decisions. The increased cushion of capital reduces the probability that taxpayers will have to finance loan losses. Finally, the measures taken under the FDICIA to scale back the too-big-to-fail doctrine will also help to improve market discipline over large banks.

Is the 8% capital requirement excessive? This is a tough question to answer. One difficulty is that the capital standards necessarily use book value rather than market value measures. Book values undoubtedly understate the value of some assets, but overstate the value of others. However, a preliminary analysis of holding company data suggests no systematic bias (see, for example, Kaufman 1991). It is also relevant that nonbank financial intermediaries tend to be better capitalized. For example, finance companies, which in some ways may be viewed as uninsured banks, operate with capital/asset ratios around 15% (Benveniste, Boyd, and Greenbaum 1991). Indeed, the 8% risk-weighted requirement amounts to a considerably lower raw capital ratio than the 8% average ratio that banks held in the 1960s. See Figure 8.

It is true that the banking industry has complained about the regulatory burden that the new reforms impose. A recent study by the Federal Financial Institutions Examination Council (1992) summarized many of the bankers' complaints. The estimated compliance costs, however, do not stem from a careful empirical analysis. The report depends largely on the results of a survey in which the bankers themselves estimated their compliance costs. While some of the estimates include FDIC insurance premiums and the opportunity cost of reserves, none include the subsidy implicit from the protection afforded by the public safety net.

Supervision and regulation has become more intrusive. Determining capital adequacy unavoidably involves examiners having to make subjective judgments about the values of bank loans. Because bank loans

are still largely information-intensive and thus not publicly traded, objective market value assessments are difficult, if not impossible.[25]

We are sympathetic to the idea that the bluntness of new capital requirements may adversely penalize lending to small and medium-sized businesses. The risk weights on the capital standards are based on broad classifications of loans. Thus, for example, LDC loans and working capital loans for small businesses receive the same weight. Our empirical analysis suggests that the main sources of loan losses are LDC and commercial real estate loans by large banks, not working capital and equipment loans to bank-dependent firms, the traditional staple of commercial bank lending. Some of the detailed but blunt restrictions on lending (for example, crudely standardized loan valuation requirements) merit reconsideration, especially for well-capitalized banks. Generally, imposing capital standards and measures which increase market discipline over large banks is a superior strategy to regulatory micro-management of lending.

4.2 LOOKING AHEAD: FUTURE DIRECTIONS FOR POLICY

We conclude by addressing two major issues which the recent reforms have not addressed. The first is whether to eliminate restrictions on interstate banking; the second (and more fundamental) is whether to scale back the system of deposit insurance.

4.2.1 Interstate Banking Restrictions on interstate banking likely contributed to the high number of failures, particularly failures of small banks in the oil and agricultural regions. But as we have argued earlier, the main stress on the system has not been the raw number of bank failures; rather, it has been the poor performance of large banks. Restrictions on interstate banking do not prevent large banks from diversifying their loan portfolios nationally. Specifically, these restrictions do not preclude banks from opening up loan production offices across state borders. While scale economies may inhibit smaller banks from pursuing this activity, large banks do not face formidable obstacles to national (or even international) lending. Accordingly, we do not think that interstate branching restrictions have been the main culprit.

At the same time, we do think that there is a strong case for further reducing restrictions on interstate banking. It is true that branching facilitates lending to smaller borrowers. In this vein, branches may be more

efficient conduits than loan production offices for cross-state lending. Any reform which improves the efficiency of large banks is worth taking seriously.

Our results also suggest that the inability to exploit scale economies rather than disproportionate loan losses may be the main problem for the smallest category of banks (those with less than $50 million in assets). Encouraging these banks to merge with larger banks may be desirable. At the same time, we are skeptical about the benefits of permitting mergers among very large banks. The clear pattern of our results is that banks in the middle of the size distribution ($100 million - $1 billion) performed best in the 1980s. Several detailed studies of the issue also concluded that recent large bank mergers have not produced efficiency gains. (See Berger and Humphrey 1991 and references therein.)

4.2.2 Scaling Back Deposit Insurance: Narrow Banking and Coinsurance The toughest question in banking policy, of course, is where exactly to draw the line for the public safety net. The kind of evidence needed to answer this question confidently is not available. Modern banking systems have been heavily regulated and heavily protected. Analysis of this kind of data provides little insight into the consequences of scaling back protection. Further, because financial systems have evolved significantly, insights from historical periods of free banking have limited value as well. As argued earlier, any discussion of banking stability for modern times should center around the performance of the money market, which is a relatively recent phenomenon.

Theory provides surprisingly little guidance. Diamond and Dybvig (1983) provided the most elegant argument for deposit insurance. They formalized the idea that banks are vulnerable to liquidity panics because they offer liquid liabilities but hold illiquid assets, the latter a direct consequence of their involvement in information-intensive lending. Diamond and Dybvig (1983) concluded that deposit insurance provides welfare gains by eliminating panic withdrawals that disrupt the flow of bank lending.

The Diamond-Dybvig paper has stimulated a lengthy academic debate over whether private financial institutions in a laissez-faire environment can make the types of arrangements necessary to avoid liquidity panics. A number of papers have pointed out that the Diamond-Dybvig results hinge on exogenous restrictions on the kinds of liabilities that banks offer savers. A key restriction is that deposit liabilities satisfy a "sequential service constraint," which requires that banks honor customer withdrawals at face value until they no longer

have funds. This makes depositors' payoffs depend on their respective place in line, creating the potential for a panic run. Several authors, e.g., Wallace (1988) and Chari (1989), have pointed out that banks could in theory avert panics by offering deposits with equity-like features. However, these types of contracts (which condition depositor payoffs on the pace of withdrawals) do not seem to be observed in practice. In the end, we are left with the impression that theory is still sufficiently incomplete to provide crisp answers.

At the same time, there are few contemporary economists who are willing to advocate a purely laissez-faire approach to banking. Perhaps coming closest to this position are advocates of *narrow banking*. The idea behind this policy is to separate the money and lending activities of banks. In its simplest form, the policy requires that transaction accounts be backed 100% by safe assets such as government securities. In this way, the money on the liability side of the banks' balance sheets is completely uncoupled from the loans on the asset side. Under the policy, banks fund loans only with liabilities that are not publicly insured. The motive for narrow banking is to protect the payments mechanism in a way that is free of the kinds of moral hazard problems that are associated with deposit insurance. The idea is not new; it dates at least to Simons (1936). And it has a distinguished and diverse group of advocates, including Friedman (1959) and Tobin (1987).

While we sympathize with the objectives of narrow banking, we have several related concerns. First, in the contemporary financial climate, cleanly separating money from lending is not as straightforward as it was at the time Simons wrote (1936). Due to financial innovation, banks now finance loans, not only with transaction accounts, but also with a wide range of money substitutes: i.e., financial assets that may be quickly converted to money. These include highly liquid instruments such as savings accounts, time and cash management accounts, and money market instruments. Off-balance sheet items such as credit lines and loan commitments also provide liquidity services for bank customers. Today these money substitutes and off-balance sheet commitments are likely a greater overall source of liquidity risk to banks than are transaction accounts, which now make up less than 20% of total bank liabilities (as compared with over 60% at the time narrow banking proposals were first introduced—recall Figure 7).

More generally, today the process of liquidity provision by banks is tied less closely (if much at all) to the quantity of transaction deposit liabilities they offer. As we have emphasized earlier, financial stability in

a contemporary environment hinges mainly on the sound operation of the money market. In this vein, the problem of managed liability runs of the type experienced by Continental Illinois is unlikely to be solved by narrow banking.

We do agree that inferring the consequences of narrow banking based on banks' existing portfolio structures is subject to a Lucas critique, since these portfolio structures would likely change. While the average maturity of bank liabilities might lengthen, we still strongly suspect that, as has been the case historically, banking would still involve the provision of liquid liabilities and the holding of illiquid information-intensive assets. At a minimum, forecasting the outcome of a narrow bank policy involves a huge degree of uncertainty. The downside risk is also great given the central role of commercial banking in short-term lending (both on and off the balance sheet).[26]

For these reasons, we think that any scaling back of the public safety net should occur on an incremental basis. In this respect, we see virtue in exploring the possibility of some form of coinsurance, where depositors bear some of the risk, much as a deductible for health insurance. As stressed by Boyd and Rolnick (1989), the policy has the virtue of permitting gradual adjustments, since the fraction of the deposit guaranteed is a continuous choice variable. Indeed, Volcker (1991) has suggested experimentation with some form of coinsurance.

Footnotes

* Thanks for help to Allen Berger, Fischer Black, Olivier Blanchard, Martin Feldstein, Stan Fischer, Chris Flinn, Jordi Gali, Simon Gilchrist, Stan Graham, Stuart Greenbaum, Jeff Gunther, Ron Johnson, Myron Kwast, Cara Lown, Franco Peracchi, Stavros Peristani, Ken Robinson, David Runkle, and Ken Wolpin. Thanks also to Gabriele Galati and Joel Krueger for outstanding research assistance, to Ken Rogoza for help with the graphics, and to Diane Sanborn for editorial assistance. Thanks also to the C.V. Starr Center for Applied Economic Research for technical support. The views expressed herein are those of the authors and not necessarily those of the Federal Reserve Bank of Minneapolis or the Federal Reserve System.

1. To quote Charles E. Schumer, senior member of the House Banking Committee: "Any idiot can make money by taking in money at 3 percent and lending it at 7 percent. But anyone who looks at the last four quarters and thinks the banking industry is back on track is making a mistake" (Labaton 1992).

2. Gorton and Rosen (1992) also emphasized the poor performance of large banks, but focus on managerial entrenchment problems. As we discuss later, managerial entrenchment problems may be an important additional factor, although we present no new evidence on this issue.

3. The relative importance of offshore loans has come as a surprise to many observers. See McCauley and Seth (1992) for a detailed analysis.

4. Roughly speaking, it is possible to divide commercial loans into two categories: those made to smaller, less well-known firms which require evaluation and monitoring and those made to highly rated firms which require relatively little information-processing. The former are typically priced off the prime lending rate, while the latter are typically priced off the cost of issuing large CDs, the banks' marginal source of funds.

5. Underlying the growth of commercial real estate borrowing were both tax incentives and relaxation of regulatory constraints on banks in the early 1980s. Subsequent reversals of the tax incentives contributed to the decline in real estate. See Litan (1992) and Hester (1992).

6. Some qualification is in order since government-sponsored securitized mortgages are treated as securities rather than mortgages in intermediary accounting statements. We thank Myron Kwast for pointing this out.

7. Checkable deposits include demand deposits and retail transactions deposits such as NOW accounts. While NOW accounts pay interest, these rates appear much less sensitive to market forces than rates on other interest-bearing bank liabilities.

8. O'Hara and Shaw (1990) presented evidence that news of the Continental bailout policy raised the stock prices of large banks, but not the stock prices of small banks [which O'Hara and Shaw dubbed too-small-to-save (p. 1588)].

9. We are not suggesting that the too-big-to-fail policy completely eliminated market discipline over large banks. Indeed, Continental management was fired. One should not focus on this policy in isolation of other events. As we discuss later, we believe it was the combined climate of too-big-to-fail, competitive pressures on banking, and possibly problems of managerial entrenchment (e.g., Boyd and Graham 1991 and Gorton and Rosen 1992) that contributed to the substantial rise in risk-taking by large banks.

10. McAllister and McManus (1992) presented evidence of gains to diversification for smaller banks.

11. Other sources of fee income include service fees on both deposit and loan accounts.

12. Brimmer (1989) provides an excellent discussion of the Penn Central crisis and the ramifications for the commercial paper market. See also Calomiris (1989).

13. Some have argued that the capital that banks are required to set against swaps (under the new Bank for International Standards agreement) does not adequately reflect the risk.

14. Thus, the organizational entities we study here are banks. It is true that many banks are owned by bank holding companies, which control one or more banks and often nonbank affiliates as well. For many purposes, the most appropriate organizational entity is the consolidated holding company. However, the objective here is specifically to study bank performance. Consolidated statements for holding company banks are not easily available. Finally, though they do not control for regional effects, Boyd and Runkle (1993) obtain evidence of an inverse relation between performance and holding company size, similar to the inverse relation between size and performance that we find at the bank level.

15. Net loan charge-offs include all loans determined to be uncollectible net recoveries on (previously written-off) loans. This entry is not an accounting expense, but rather a reduction in a reserve account. Provision for loan losses is the accounting expense entry which reduces profits and was discussed in Section 3. When the data are averaged over several years as we do here, the two loan loss measures are highly correlated. Thus, for the present purposes, it makes little difference which is employed. We consider charge-offs because we eventually want to make quantitative statements about actual losses.

16. Ideally, we would like to measure ex ante portfolio risk. However, this is extremely difficult to do for banks for several reasons. First, the sample period is relatively short. Second, the data are based on accounting rather than market value measures. There is considerable evidence that the accounting data are intentionally smoothed (for example, see Boyd and Runkle 1993). This has the effect of causing accounting measures to systematically understate risk.

17. Though we do not report the statistics here, the general results we obtain are robust to using the first half of the sample period, 1984–86, and also to running the regressions year by year.

18. The results are the same if we use net charge-offs divided by loans, rather than net charge-offs divided by assets as the dependent variable. We chose the latter since we were interested in analyzing the ex post performance of the entire bank portfolio.

19. Because equity is measured in book values, we did not consider the rate of return on equity as an alternative dependent variable. Since this measure does not include capital gains and losses on equity, it could be seriously distorted. For example, a bank with near zero equity due to poor performance could have a high ratio of net income to equity.

It is true that there is a size bias in net income to assets, since large banks use systematically more financial leverage. However, a reasonable calculation suggests that this bias is small relative to the differences we observe in the data.

20. In point of fact, banks in this size category participated in LDC loan syndications. However, they did not typically adopt the same degree of risk exposure as did the larger banks. Indeed, Dornbusch (1986) observed that some money center banks held LDC loans equal to twice their capital.

More generally, scale economies may explain why only large banks can originate certain types of loans such as LDC loans. However, since loan sales are possible, scale economies do not explain why large banks hold a larger share of these assets on their balance sheets.

21. It is also possible that managerial entrenchment problems may be an important reason why large banks tried to maintain their asset base in the face of significant competitive pressures (Boyd and Graham 1991, Gorton and Rosen 1992). However, we believe that the implicit subsidy of purchased money afforded by the too-big-to-fail policy was important in supporting this objective.

22. We are assuming that class four bank portfolios are available in elastic supply (that is, we are assuming that the type of portfolio held by class four banks is available in elastic supply to class five and six banks).

23. Avery and Berger (1991b) make a similar observation for the year 1989.

24. See Schwartz (1992) for a discussion of how the nature of discount borrowing changed in the 1980s from its traditional role as a mechanism to help banks meet temporary shortfalls in reserves to a channel for helping large banks in trouble.

25. For this reason, widespread adoption of market value accounting seems impractical. (See O'Hara 1992.) For an opposing view, see White (1991).

26. As Lucas (1988, p. 288) puts it, "Attempting various policies that may be proposed on actual economies and watching the outcome must not be taken as a serious solution method: Social Experiments on the grand scale may be instructive and admirable, but they are best admired at a distance."

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Table 1 BANK FAILURES BY CENSUS REGION

Region	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total 1980–91
New England	1	0	1	0	0	0	0	2	0	3	9	12	28
Middle Atlantic	1	3	6	3	1	4	0	3	1	3	7	6	38
South Atlantic	2	2	2	0	3	2	3	4	4	7	6	8	43
East South Central	2	0	5	14	13	9	5	4	0	1	1	2	56
West South Central	0	3	11	7	12	34	58	108	163	150	115	32	693
East North Central	1	3	5	7	8	4	3	7	5	0	1	3	47
West North Central	4	2	5	10	37	46	43	33	28	9	6	4	227
Mountain	2	0	3	5	12	19	26	16	19	11	14	6	133
Pacific	0	2	3	10	11	10	11	11	13	9	4	2	86
United States	13	15	41	56	97	128	149	188	233	193	163	75	1,351

Source: FDIC

Table 2 BANK FAILURES BY SIZE CLASS: 1986–90

Asset size class	Number of failed banks	% of total failures	Assets of failed banks ($ mil.)	% of total failed-bank assets
Less than $500 million	912	96.6%	$44.4	40.4%
$500 million – $1 billion	19	2.0	12.1	11.0
$1 billion – $5 billion	10	1.1	18.8	17.1
More than $5 billion	3	0.3	34.6	31.4

Source: FDIC

Table 3 PROBLEM REAL ESTATE LOANS BY BANK SIZE*
(Third Quarter 1992)

	Size of Bank			
Category of Loans	Less than $100 mil.	$100 mil. - $1 bil.	$1 bil. - $10 bil.	Over $10 bil.
All Real Estate Loans	1.64%	2.18%	4.05%	7.07%
Construction	2.76	5.62	12.65	21.96
Commercial	2.10	3.01	5.33	10.84
1-4 Family	1.21	1.23	1.50	1.76

*Each entry is the percentage of loans noncurrent. A *noncurrent loan* is one that is past due 90 days or more or that is in a nonaccrual status.

Source: FDIC

Table 4 PROBLEM REAL ESTATE LOANS BY REGION*
(Third Quarter 1992)

	Region					
Category of Loans	North-East	South-East	Central	Mid-West	South-West	West
All Real Estate	7.2%	2.5%	1.9%	1.5%	2.5%	5.1%
Construction	23.8	6.3	6.0	2.4	4.0	16.9
Commercial	10.0	3.8	2.8	3.1	3.9	5.9
1-4 Family	2.4	1.1	0.9	0.6	1.3	1.5
Home Equity	1.7	0.4	0.4	0.3	0.7	0.7

*Each entry is the percentage of loans noncurrent. A *noncurrent loan* is one that is past due 90 days or more or that is in a nonaccrual status.

Source: FDIC

Table 5 MODEL OF BANK PERFORMANCE AND SIZE, CONTROLLING FOR REGIONAL EFFECTS*

Equation (1)'s dependent variables and time periods***	Size class** 1	2	3	4	5	6	Adj. R^2	F
Net charge-offs/Assets								
1984–91	0.00029	-0.00042	0	0.00069	0.00149	0.00467	0.11	232.59
	(1.64)	(-2.04)		(2.16)	(4.56)	(4.33)		(0.00)
1987–91	-0.00014	-0.00045	0	0.00150	0.00254	0.00600	0.12	135.59
	(-0.61)	(-1.81)		(3.37)	(6.94)	(4.81)		(0.00)
Net income/Assets								
1984–91	-0.00108	0.00077	0	−0.00126	-0.00237	-0.00599	0.10	144.66
	(-3.72)	(2.43)		(-2.24)	(-4.47)	(-3.80)		(0.00)
1987–91	-0.00236	-0.0005	0	−0.00185	−0.0035	−0.00556	0.12	129.24
	(-6.11)	(-1.21)		(−2.34)	(−5.57)	(−4.30)		(0.00)

*Table 5 reports estimates of a model which includes 9 region and 6 size class dummies, with size class 3 coefficient-normalized at zero. The *t*-statistics are in parentheses and are corrected for heteroskedasticity using a White correction. The *F*-statistic and the significance level reported in the last column refer to the test that all regional dummies are equal.

**Asset-size classes: 1: $0 - $50 mil. 2: $50 mil. - $100 mil. 3: $100 mil. - $250 mil. 4: $250 mil. - $1 bil. 5: $1 bil. - $10 bil. 6: over $10 bil.

***Dependent variables are time-averaged over the respective sample periods. Independent variables are based on the year prior to the respective sample period.

Table 6 COEFFICIENT TESTS ON THE SIZE EFFECTS*

Dependent variables and time periods	Size classes compared 6=5	6=4	5=4	2=1
Net charge-offs/Assets				
1984–91	8.37	13.19	4.22	22.44
	(0.00)	(0.00)	(0.04)	(0.00)
1987–91	7.49	12.03	4.22	2.94
	(0.01)	(0.00)	(0.04)	(0.09)
Net income/Assets				
1984–91	5.00	8.36	2.66	68.21
	(0.03)	(0.00)	(0.10)	(0.00)
1987–91	2.32	6.39	3.31	38.23
	(0.13)	(0.01)	(0.07)	(0.00)

*Table 6 reports *F*-statistics and significance levels for tests of equality of size coefficients between different size classes.

Table 7 MODEL WITH REGION-SPECIFIC SIZE EFFECTS*

Equation (2)'s dependent variables and time periods***	Averages of interaction coefficients by size class**						Adj. R^2	% gain in SSR
	1	2	3	4	5	6		
Net charge-offs/Assets								
1984–91	0.00015 (5.53)	-0.00033 (1.77)	0	0.00048 (1.79)	0.00125 (6.34)	0.00347 (28.35)	0.12	2.87
1987–91	-0.00038 (1.38)	-0.00047 (1.56)	0	0.00158 (2.48)	0.00233 (9.28)	0.00630 (18.70)	0.12	2.57
Net income/Assets								
1984–91	-0.00087 (10.79)	0.00082 (2.21)	0	−0.00111 (1.59)	−0.00192 (6.72)	−0.00432 (16.49)	0.12	5.57
1987–91	-0.00200 (8.75)	-0.00001 (1.36)	0	−0.00154 (1.43)	−0.00315 (8.20)	−0.00389 (11.15)	0.12	4.78

*Table 7 reports estimates of a model which includes 9 regional and 54 interaction terms between size classes and regions, with the coefficients on the interaction terms for size class 3 banks normalized at zero. Reported are weighted averages of the size coefficients, where the weights depend on the fraction of banks in the size class within the region. The *F*-statistics for tests that the coefficient terms for a size class are jointly zero across regions are in parentheses and are corrected for heteroskedasticity using a White correction. The last columns reports the percentage gain in SSR from using the model with region-specific size effects instead of the model where size effects are constant across regions.

**Asset-size classes: 1: $0 – $50 mil. 2: $50 mil. – $100 mil. 3: $100 mil. – $250 mil. 4: $250 mil. – $1 bil. 5: $1 bil. – $10 bil. 6: over $10 bil.

***Dependent variables are time-averaged over the respective sample periods. Independent variables are based on the year prior to the respective sample period.

Table 8 JOINT COEFFICIENT TESTS OF REGION-SPECIFIC SIZE EFFECTS

Dependent variables and time periods	Size classes compared			
	6=5	6=4	5=4	2=1
Net charge-offs/Assets				
1984-91	4.63 (0.00)	44.48 (0.00)	6.04 (0.00)	4.39 (0.00)
1987-91	6.56 (0.00)	11.32 (0.00)	4.67 (0.00)	2.08 (0.03)
Net income/Assets				
1984–91	2.89 (0.01)	15.55 (0.00)	3.77 (0.00)	10.53 (0.00)
1987-91	5.86 (0.00)	3.69 (0.00)	3.13 (0.00)	11.57 (0.00)

Table 8 reports *F*-statistics and significance levels for tests of the hypothesis that the interaction terms for two size classes are jointly equal across regions.

Table 9 MODEL WITH SIZE EFFECTS, CONTROLLING FOR BOTH LOAN COMPOSITION AND REGION

Dependent variables and time periods***	size class*						Commercial real estate/ total loans	C&I/ total loans	Adj. R^2
	1	2	3	4	5	6			
Net charge-offs/Assets									
1984-91	0.00079	-0.00016	0	0.00051	0.00108	0.0035	-0.00091	0.00598	0.13
	(4.04)	(-0.81)		(1.63)	(3.29)	(3.25)	(-1.24)	(9.97)	
1987-91	0.00045	0.0000	0	0.00127	0.00236	0.00465	0.00585	0.0063	0.14
	(2.04)	(-0.02)		(2.97)	(7.00)	(5.89)	(5.74)	(9.62)	
Net income/Assets									
1984-91	-0.00251	-0.00011	0	-0.00088	-0.00163	-0.00381	-0.00511	-0.01372	0.12
	(-8.09)	(0.36)		(-1.60)	(-3.21)	(-2.64)	(-4.29)	(-13.28)	
1987-91	-0.00264	-0.00083	0	-0.00117	-0.00315	-0.00491	-0.01583	-0.0139	0.14
	(-7.47)	(-2.24)		(-1.53)	(-5.31)	(-4.43)	(-8.77)	(-12.47)	

*Table 9 reports estimates of model which includes 9 regional, 6 size class dummies, and two portfolio variables: commercial real estate loans (mortgage loans over total loans) and C&I loans over total loans (C&I). The size class 3 coefficient is normalized at zero. The *t*-statistics are in parentheses and are corrected for heteroskedasticity using a White correction.

**Asset-size classes: 1: $0 - $50 mil. 2: $50 mil. - $100 mil. 3: $100 mil. - $250 mil. 4: $250 mil. - $1 bil. 5: $1 bil. - $10 bil. 6: over $10 bil.

***Dependent variables are time-averaged over the respective sample periods. Independent variables are based on the year prior to the respective sample period.

Table 10 COEFFICIENT TESTS ON THE MODEL WITH LOAN COMPOSITION VARIABLES*

Dependent variables and time periods	Size classes compared			
	6=5	6=4	5=4	2=1
Net charge-offs/Assets				
1984-91	4.91	7.45	2.09	38.62
	(0.03)	(0.01)	(0.03)	(0.00)
1987-91	7.95	15.61	5.24	7.39
	(0.00)	(0.00)	(0.02)	(0.00)
Net income/Assets				
1984-91	2.21	3.82	1.31	126.17
	(0.14)	(0.05)	(0.25)	(0.00)
1987-91	2.29	8.09	4.83	38.43
	(0.13)	(0.00)	(0.03)	(0.00)

*Table 10 reports *F*-statistics and significance levels for tests of the equality of size coefficients between different size classes.

Table 11 REDUCTION IN AGGREGATE LOAN LOSSES IF LARGE BANKS (>$1 BIL. ASSETS) HAD EXPERIENCED SAME LOSS RATE AS MIDDLE-SIZED BANKS ($250 MIL. - $1 BIL.)*

	Reduction by size of bank					
	$1 bil. - $10 bil. assets		Over $10 bil. assets		Over $1 bil. assets	
Time period	%	$ bil.	%	$ bil.	%	$ bil.
1983	5.3	0.53	7.5	0.75	12.9	1.29
1984	2.6	0.28	19.6	2.12	22.3	2.41
1985	−1.2	-0.16	13.6	1.79	12.4	1.64
1986	-2.1	-0.34	14.6	2.39	12.5	2.04
1987	6.1	0.94	13.0	2.01	19.1	2.96
1988	10.4	1.85	20.9	3.71	31.4	5.57
1989	6.8	1.47	31.3	6.75	38.0	8.20
1990	8.6	2.34	32.4	8.83	41.0	11.17
1991	7.2	2.21	25.6	7.83	32.7	10.01
total reduction 1983-91		9.12		36.18		45.29
mean 1983-91	4.9	1.01	19.8	4.02	24.7	5.03
mean 1987-91	7.8	1.76	24.7	5.83	32.5	7.58

Table 12 PERCENTAGE OF ASSETS OF CAPITAL-CONSTRAINED BANKS BY SIZE CLASS*

	Share of each bank size								
	$0 - $250 mil		$250 mil. - $1 bil.		$1 bil. - $10 bil.		over $10 bil.		c.a. for all banks
Year	c.a.	t.a.	c.a.	t.a.	c.a.	t.a.	c.a.	t.a.	
1990	2.86	3.90	4.05	9.81	24.17	20.73	68.92	45.66	26.16
1991	5.65	2.78	6.14	5.16	28.01	8.59	60.20	14.15	9.32

For each size class of banks, this table reports the % of assets held by capital-constrained banks within that size class over the total assets of all capital-constrained banks (c.a.) and the % of assets of capital-constrained banks within that size class over the total bank assets of that size class (t.a.).

Appendix: DISTRIBUTION OF BANKS ACROSS REGIONS AND SIZE CLASSES, 1983 VS. 1986

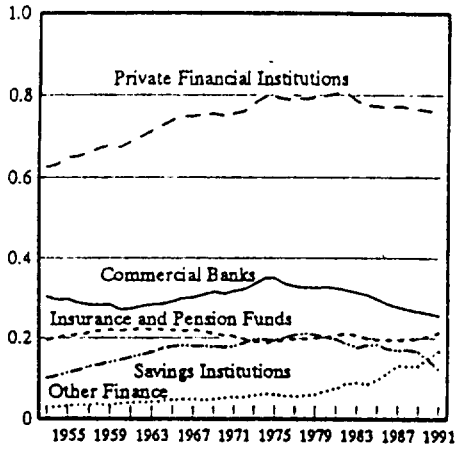
1983	Size class						
Region	1	2	3	4	5	6	Total
New England	104	62	56	40	9	1	272
Mid. Atlantic	208	153	120	85	49	10	625
S. Atlantic	859	266	159	75	42	0	1,401
E.S. Central	695	208	94	31	14	0	1,042
W.S. Central	1,741	604	272	101	24	4	2,746
E.N. Central	1,802	572	364	113	31	3	2,885
W.N. Central	2,800	422	179	35	13	0	3,449
Mountain	660	135	73	23	17	0	908
Pacific	340	115	56	38	21	5	575
United States	9,209	2,537	1,373	541	220	23	13,903

Asset-size classes: 1: $0 - $50 mil. 2: $50 mil. - $100 mil. 3: $100 mil. - $250 mil. 4: $250 mil. - $1 bil. 5: $1 bil. - $10 bil. 6: over $10 bil.

1986	Size class						
Region	1	2	3	4	5	6	Total
New England	61	50	62	51	17	1	242
Mid. Atlantic	147	126	144	90	63	13	583
S. Atlantic	682	306	186	86	61	6	1,327
E.S. Central	531	242	122	34	20	0	949
W.S. Central	1,694	615	307	104	24	2	2,746
E.N. Central	1,455	630	421	150	40	3	2,699
W.N. Central	2,461	478	188	45	19	2	3,193
Mountain	633	152	82	27	19	1	914
Pacific	272	138	93	45	25	5	578
United States	7,936	2,737	1,605	632	288	33	13,231

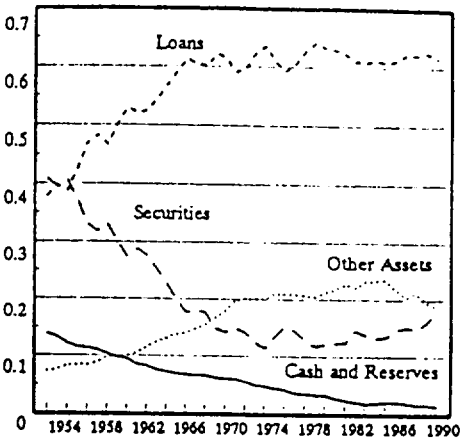
Asset-size classes: 1: $0 - $50 mil. 2: $50 mil. - $100 mil. 3: $100 mil. - $250 mil. 4: $250 mil. - $1 bil. 5: $1 bil. - $10 bil. 6: over $10 bil.

Figure 1 Share of Financial Institutions in Total Credit*



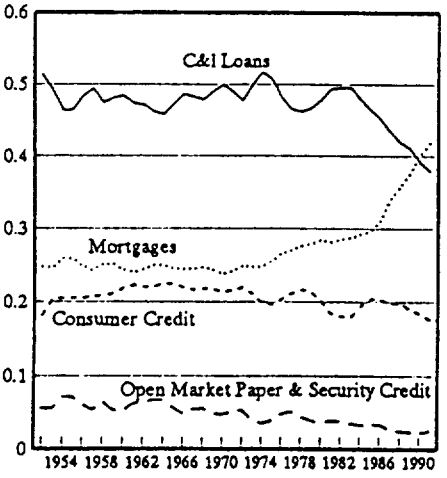
* Fractions of total funds advanced in credit markets to domestic nonfinancial sectors.

Figure 2 Composition of Commercial Bank Assets*



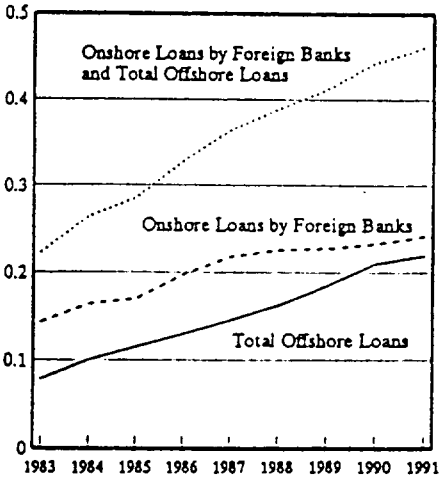
* Fractions of total assets. (Securities include corporate bonds, which are of trivial magnitude.)

Figure 3 Composition of Commercial Bank Loans*



* Fractions of total loans.

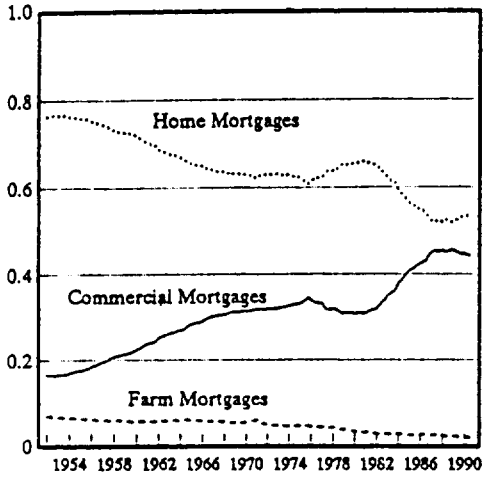
Figure 4 Foreign Share of U.S. C&I Loans



* Fractions of total C&I loans. Total C&I loans include all loans (both onshore and offshore) to U.S. addressees by both foreign and domestic banks. (Flow of funds data on C&I loans excludes foreign offshore loans.)

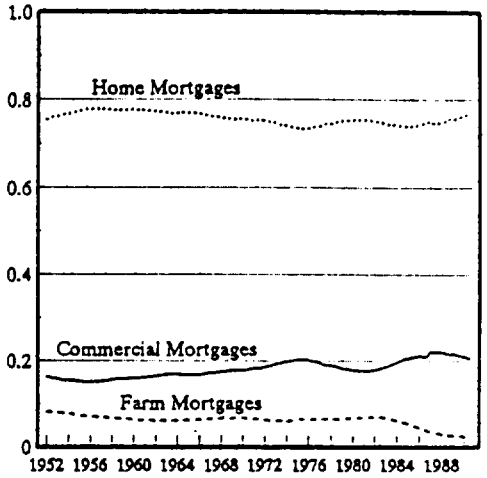
Sources: Flow of Funds Accounts (Figures 1-3), Federal Reserve Bulletin and Federal Reserve Bank of New York Quarterly Review (Figure 4)

Figure 5 Composition of Commercial Bank Mortgages*



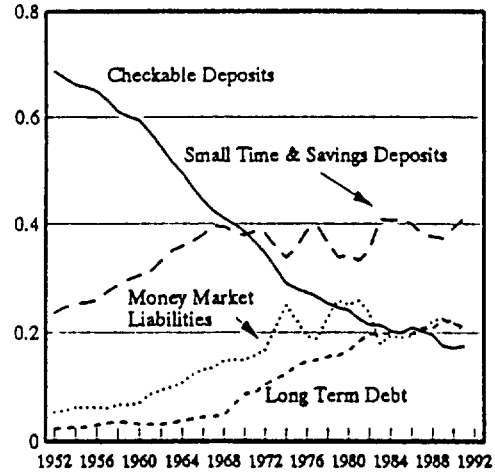
*Fractions of total mortgages. (Home mortgages include multifamily residential mortgages.)

Figure 6 Composition of Mortgages for all Intermediaries*



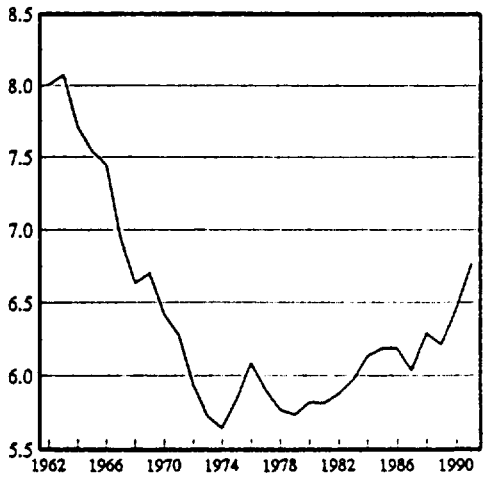
* Fractions of total mortgages. (Home mortgages include multifamily residential mortgages.)

Figure 7 Composition of Commercial Bank Liabilities*



* Fractions of total liabilities. (Money market funds include Federal funds, security repurchase agreements, and large time deposits.)

Figure 8 Bank Equity Capital as a Percentage of Total Assets



Sources: Flow of Funds Accounts (Figures 5-7), and FDIC (Figure 8)

Figure 9 Composition of Interest Bearing Assets
by Bank Size

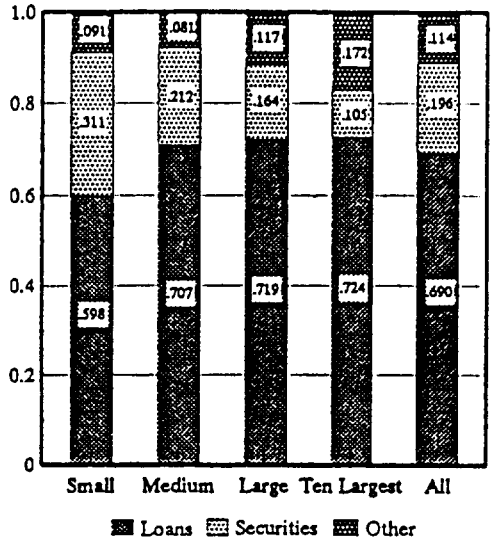


Figure 10 Composition of Loans
by Bank Size

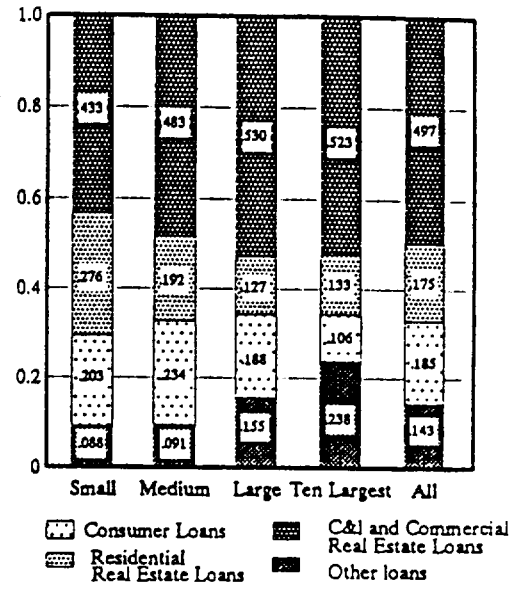


Figure 11 Composition of Liabilities
by Bank Size

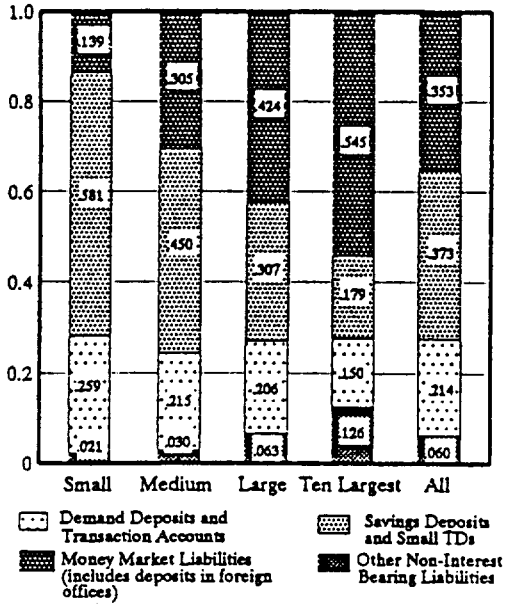
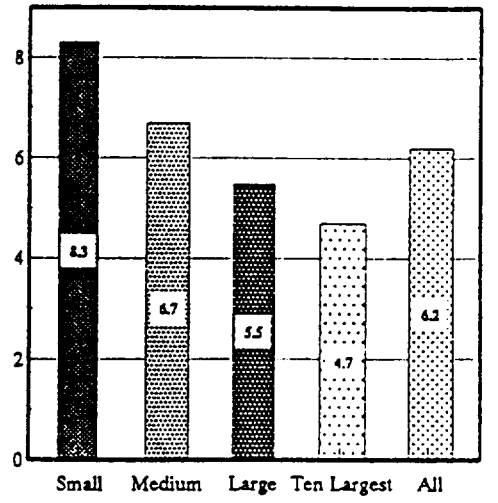


Figure 12 Bank Equity Capital as a Percentage of Total Assets
by Bank Size



Source: Federal Reserve Bulletin. Data are averaged over the period 1987-1991
Note: The definitions of bank asset size are as follows: small: 0-300 mil., medium: 300 mil.-5 bil., large: 5 bil. excluding 10 largest banks

Figure 13 Net Interest Margin and Noninterest Income as a Percentage of Assets
by Bank Size

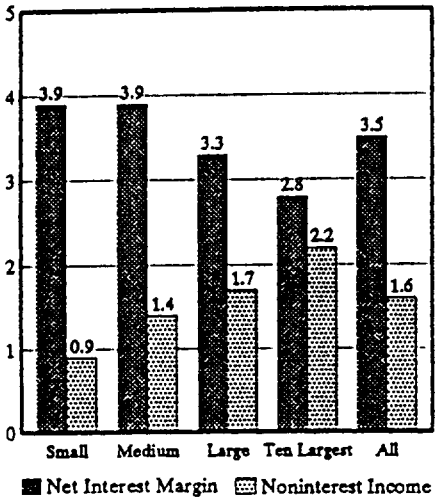


Figure 14: Net Interest Margin and Noninterest Income as a Percentage of Assets
All Banks

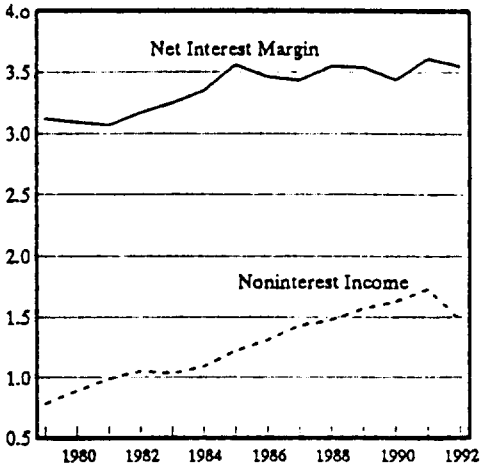
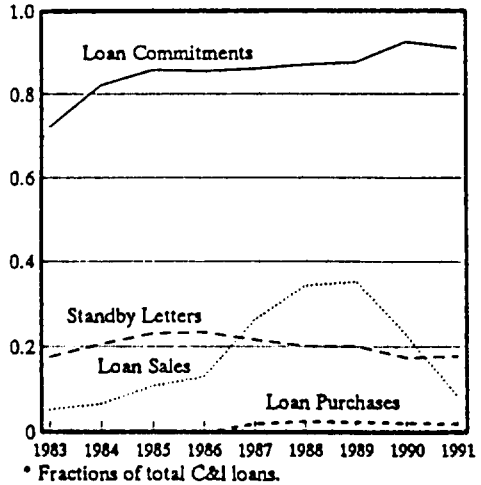
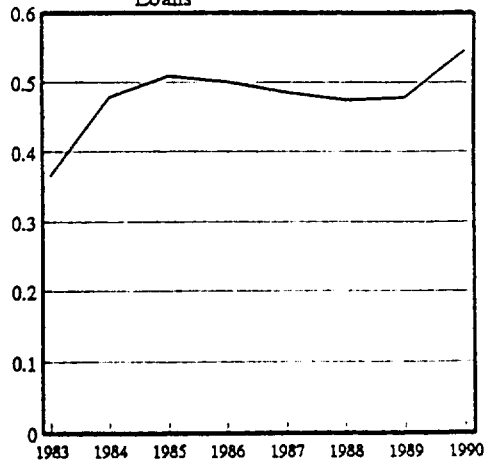


Figure 15 Selected Gross Offbalance Sheet Numbers for Business Lending*



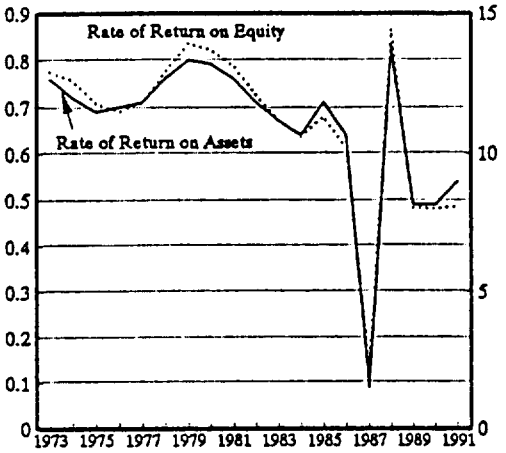
* Fractions of total C&I loans.

Figure 16 Credit Equivalent Offbalance Sheet Positions as a Fraction of Total C&I Loans



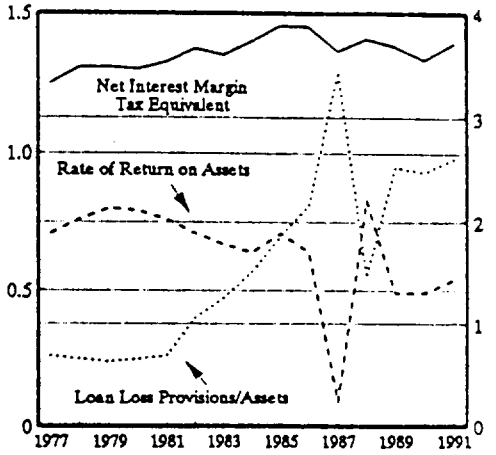
Source:Federal Reserve Bulletin (Figures 13-14), and Call Report (Figures 15-16)
Note: The definitions of bank asset size in Figure 13 are as follows: small: 0-300 mil.,medium:300 mil.-5 bil.,large:over 5 bil., excluding the 10 largest banks

Figure 17 Commercial Bank Profitability



Left Axis: Percent - Rate of Return on Assets
Right Axis: Percent - Rate of Return on Equity

Figure 18 Commercial Bank Performance Measures



Left Axis: Percent - Rate of Return on Assets,
Loan Loss Provisions on Assets
Right Axis: Percent - Net Interest Margin

Figure 19 Distribution of Banks and Bank Assets
by Size Class

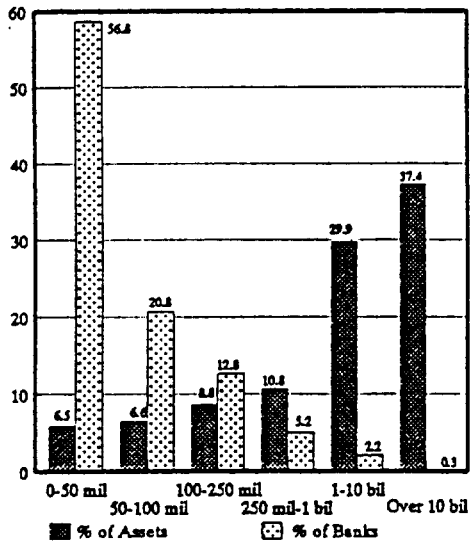
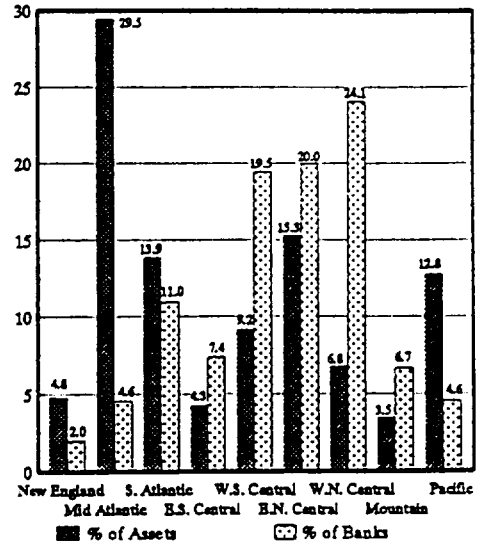


Figure 20 Distribution of Banks and Bank Assets
by Census Region



Source: Federal Reserve Bulletin (Figures 17-18), and Call Report (Figures 19-20). The data are averages over the period 1983-91.

Figure 21 Provisions for Loan Losses to Assets
by Census Region

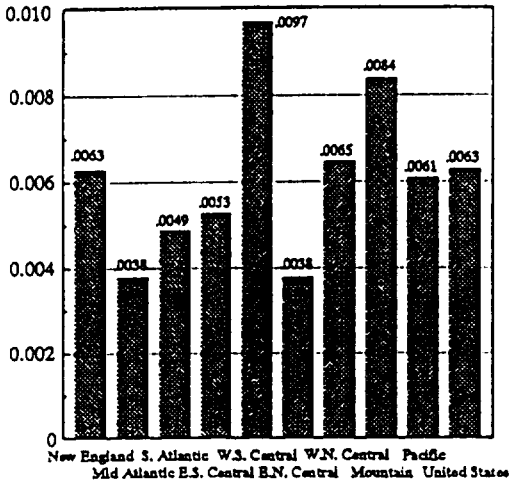


Figure 22 Net Income to Assets
by Census Region

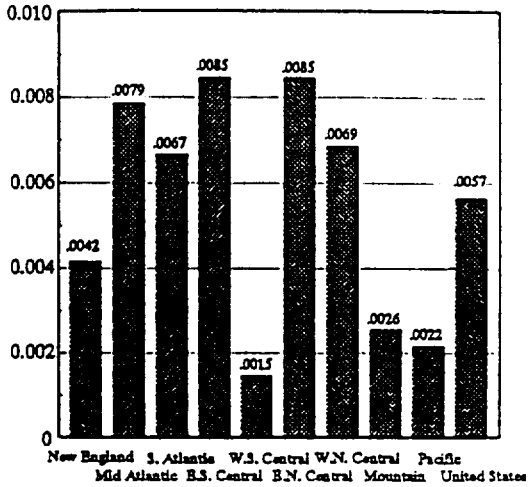


Figure 23: Provisions for Loan Losses to Assets
by Bank Asset Size

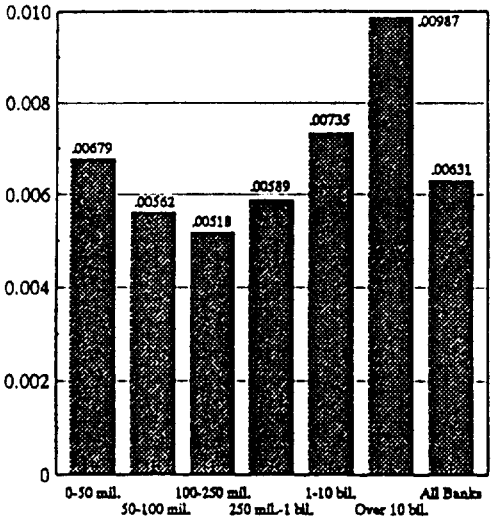
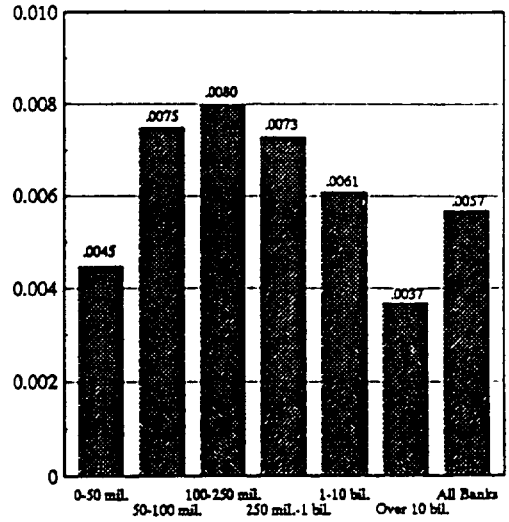


Figure 24: Net Income to Assets
by Bank Asset Size



Source: Call Report. Data are averaged over individual banks over 1983-91