

The Decline of Traditional Banking: Implications for Financial Stability and Regulatory Policy

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The traditional banking business has been to make long-term loans and fund them by issuing short-dated deposits, a process that is commonly described as “borrowing short and lending long.” In recent years, fundamental economic forces have undercut the traditional role of banks in financial intermediation. As a source of funds for financial intermediaries, deposits have steadily diminished in importance. In addition, the profitability of traditional banking activities such as business lending has diminished in recent years. As a result, banks have increasingly turned to new, nontraditional financial activities as a way of maintaining their position as financial intermediaries.²

This article has two objectives: to examine the forces responsible for the declining role of traditional banking in the United States as well as in other countries, and to explore the implications of this decline and banks’ responses to it for financial stability and regulatory policy. A key policy issue is whether the decline of banking threatens to make the financial system more fragile. If

nothing else, the prospect of a mass exodus from the banking industry (possibly via increased failures) could cause instability in the financial system. Of greater concern is that declining profitability could tip the incentives of bank managers toward assuming greater risk in an effort to maintain former profit levels. For example, banks might make loans to less creditworthy borrowers or engage in nontraditional financial activities that promise higher returns but carry greater risk. A new activity that has generated particular concern recently is the expanding role of banks as dealers in derivatives products. There is a fear that in seeking new sources of revenue in derivatives, banks may be taking risks that could ultimately undermine their solvency and possibly the stability of the banking system.

The challenge posed by the decline of traditional banking is twofold: we need to maintain the soundness of the banking system while restructuring the banking industry to achieve long-term financial stability. A sound regulatory policy can encourage an orderly shrinkage of

traditional banking while strengthening the competitive position of banks, possibly by allowing them to expand into more profitable, nontraditional activities. In the transitional period, of course, regulators would have to continue to guard against excessive risk taking that could threaten financial stability.

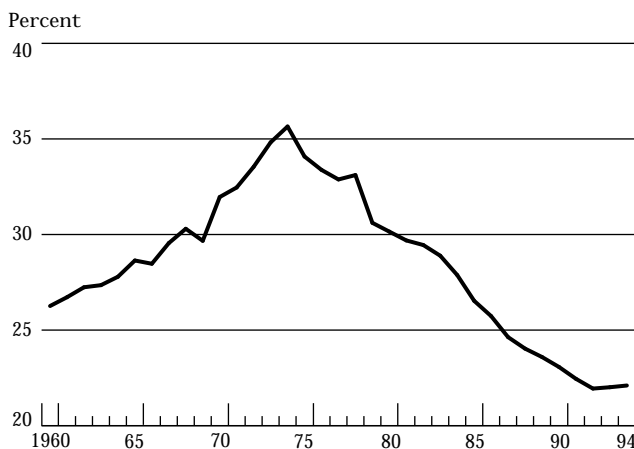
The first part of our article documents the declining financial intermediation role of traditional banks in the United States. We discuss the economic forces driving this decline, in both the United States and foreign countries, and describe how banks have responded to these pressures. Included in this discussion is an examination of banks' activities in derivatives markets, a particularly fast-growing area of their off-balance-sheet activities. Finally, we examine the implications of the changing nature of banking for financial fragility and regulatory policy.

THE DECLINE OF TRADITIONAL BANKING IN THE UNITED STATES

In the United States, the importance of commercial banks as a source of funds to nonfinancial borrowers has shrunk dramatically. In 1974 banks provided 35 percent of these funds; today they provide around 22 percent (Chart 1).

Chart 1

Commercial Banks' Share of Total Nonfinancial Borrowing
1960-94



Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

Thrift institutions (savings and loans, mutual savings banks, and credit unions), which can be viewed as specialized banking institutions, have also suffered a decline in market share, from more than 20 percent in the late 1970s to below 10 percent in the 1990s (Chart 2).

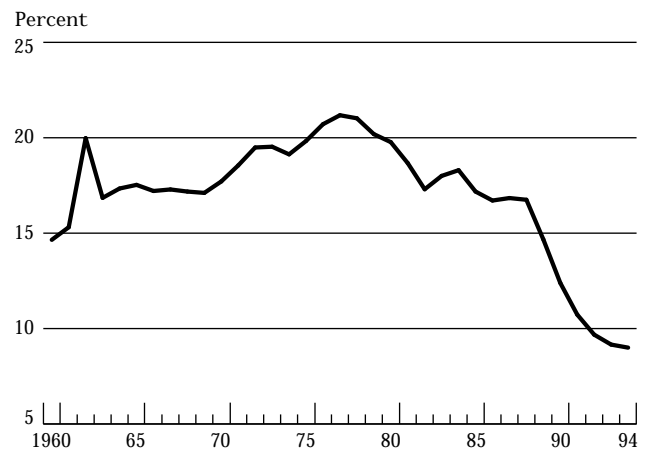
Another way of viewing the declining role of banking in traditional financial intermediation is to look at

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the size of banks' balance-sheet assets relative to those of other financial intermediaries (Table 1). Commercial banks' share of total financial intermediary assets fell from around the 40 percent range in the 1960-80 period to below 30 percent by the end of 1994. Similarly, the share of total financial intermediary assets held by thrift institutions

Chart 2

Thrifts' Share of Total Nonfinancial Borrowing
1960-94



Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

Table 1
RELATIVE SHARES OF TOTAL FINANCIAL INTERMEDIARY
ASSETS, 1960-94
Percent

	1960	1970	1980	1990	1994
Insurance companies					
Life insurance	19.6	15.3	11.5	12.5	13.0
Property and casualty	4.4	3.8	4.5	4.9	4.6
Pension funds					
Private	6.4	8.4	12.5	14.9	16.2
Public (state and local government)	3.3	4.6	4.9	6.7	8.4
Finance companies	4.7	4.9	5.1	5.6	5.3
Mutual funds					
Stock and bond	2.9	3.6	1.7	5.9	10.8
Money market	0.0	0.0	1.9	4.6	4.2
Depository institutions (banks)					
Commercial banks	38.6	38.5	37.2	30.4	28.6
Savings and loans and mutual savings	19.0	19.4	19.6	12.5	7.0
Credit unions	1.1	1.4	1.6	2.0	2.0
Total	100.0	100.0	100.0	100.0	100.0

Source: Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

declined from around 20 percent in the 1960-80 period to below 10 percent by 1994.³

Boyd and Gertler (1994) and Kaufman and Mote (1994) correctly point out that the decline in the share of total financial intermediary assets held by banking institutions does not necessarily indicate that the banking industry is in decline. Because banks have been increasing their off-balance-sheet activities (an issue we discuss below), we may understate their role in financial markets if we look solely at the on-balance-sheet activities. However, the decline in *traditional* banking, which is reflected in the decline in banks' share of total financial intermediary assets, raises important policy issues that are the focus of this article.

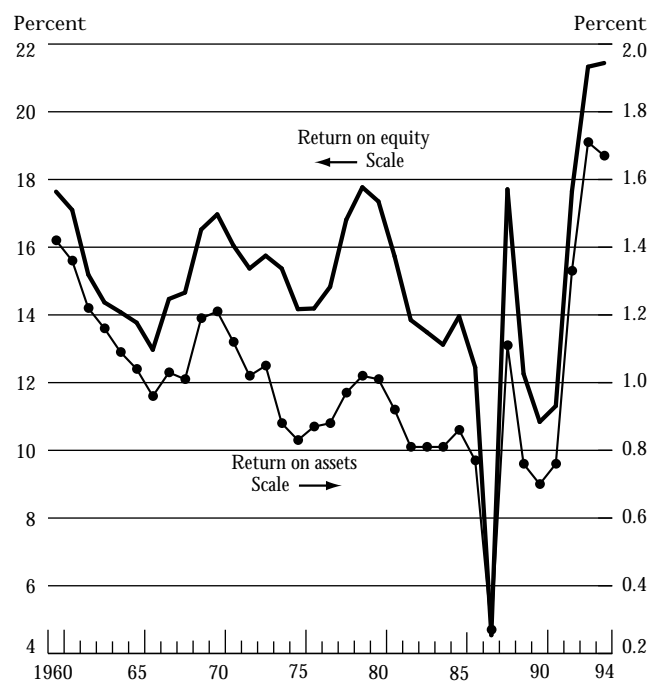
There is also evidence of an erosion in traditional banking profitability. Nevertheless, standard measures of commercial bank profitability such as pretax rates of return on assets and equity (shown in Chart 3) do not provide a clear picture of the trend in bank profitability. Although banks' before-tax rate of return on equity declined from an average of 15 percent in the 1970-84 period to below 12 percent in the 1985-91 period, bank profits improved sharply beginning in 1992, and 1994 was a record year for bank profits.

Overall bank profitability, however, is not a good indicator of the profitability of traditional banking because it includes the increasingly important nontraditional businesses of banks. As a share of total bank income, noninterest income derived from off-balance-sheet activities, such as fee and trading income, averaged 19 percent in the 1960-80 period (Chart 4). By 1994, this source of income had grown to about 35 percent of total bank income. Although some of this growth in fee and trading income may be attributable to an expansion of traditional fee activities, much of it is not.

A crude measure of the profitability of the traditional banking business is to exclude noninterest income from total earnings, since much of this income comes from nontraditional activities. By this measure, the pretax return on equity fell from *more than* 10 percent in 1960 to levels that approached *negative* 10 percent in the late 1980s and early 1990s (Chart 5). This measure, however, does not adjust for the expenses associated with generating nonin-

Chart 3

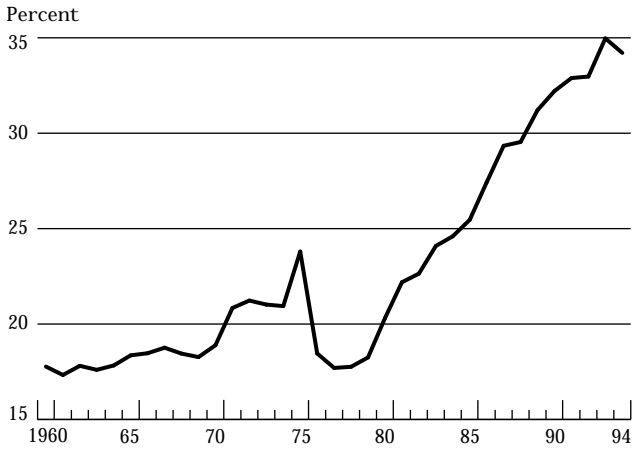
Return on Assets and Equity for Commercial Banks
1960-94



Sources: Federal Deposit Insurance Corporation, *Statistics on Banking and Quarterly Banking Profile*.

Chart 4

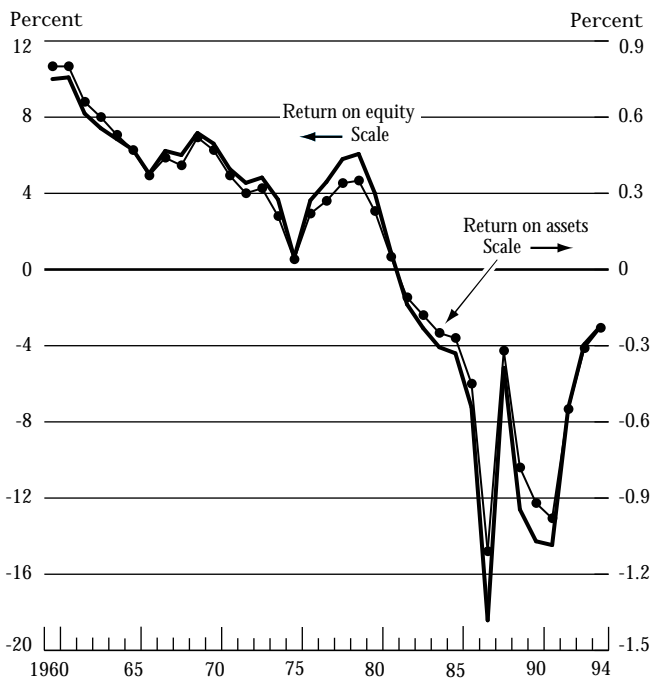
Share of Noninterest Income in Total Income for Commercial Banks 1960-94



Sources: Federal Deposit Insurance Corporation, *Statistics on Banking and Quarterly Banking Profile*.

Chart 5

Return on Assets and Equity for Commercial Banks Excluding Noninterest Income 1960-94



Sources: Federal Deposit Insurance Corporation, *Statistics on Banking and Quarterly Banking Profile*.

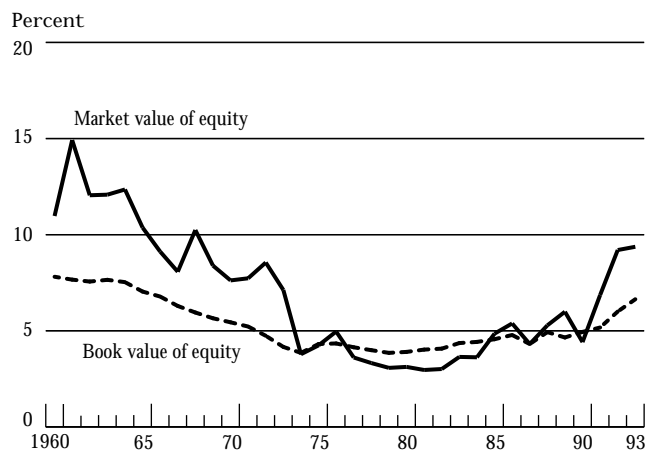
terest income and therefore overstates the decline in the profitability of traditional banking. Another indicator of the decline in the profitability of traditional banking is the fall in the ratio of market value to book value of bank capital from the mid-1960s to the early 1980s. As noted by Keeley (1990), this fall indicates that bank charters were becoming less valuable in this period (Chart 6). The decline in the value of bank charters in the years preceding the sharp increase in nontraditional activities supports the view that there was a substantial decline in the profitability of traditional banking. Only with the rise in nontraditional activities that begins in the early 1980s (Chart 4) does the market value of banks begin to rise.

WHY IS TRADITIONAL BANKING IN DECLINE?

Fundamental economic forces have led to financial innovations that have increased competition in financial markets. Greater competition in turn has diminished the cost advantage banks have had in acquiring funds and has undercut their position in loan markets. As a result, traditional banking has lost profitability, and banks have begun to diversify into new activities that bring higher returns.

Chart 6

Equity-to-Asset Ratios, Market Value vs. Book Value 1960-93



Source: Standard and Poor's Compustat.

Note: Chart presents equity-to-asset ratios for the top twenty-five bank holding companies in each year.

DIMINISHED ADVANTAGE IN ACQUIRING FUNDS (LIABILITIES)

Until 1980, deposits were a cheap source of funds for U.S. banking institutions (commercial banks, savings and loans, mutual savings banks, and credit unions). Deposit rate ceilings prevented banks from paying interest on checkable deposits, and Regulation Q limited them to paying specified interest rate ceilings on savings and time deposits. For many years, these restrictions worked to the advantage of banks because a major source of bank funds was checkable deposits (in 1960 and earlier years, these deposits constituted more than 60 percent of total bank deposits). The zero interest cost on these deposits resulted in banks having a low average cost of funds.

This cost advantage did not last. The rise in inflation beginning in the late 1960s led to higher interest rates and made investors more sensitive to yield differentials on different assets. The result was the so-called disintermediation process, in which depositors took their money out of banks paying low interest rates on both checkable and time deposits and purchased higher yielding assets. In addition, restrictive bank regulations created an opportunity for nonbank financial institutions to invent new ways to offer bank depositors higher rates. Nonbank competitors were not subject to deposit rate ceilings and did not have the costs associated with having to hold non-interest-bearing reserves and paying deposit insurance premiums. A key development was the creation of money market mutual funds, which put banks at a competitive disadvantage because money market mutual fund shareholders (or depositors) could obtain check-writing services while earning a higher interest rate on their funds. Not surprisingly, as a source of funds for banks, low-cost checkable deposits declined dramatically, falling from 60 percent of bank liabilities in 1960 to under 20 percent today.

The growing disadvantage of banks in raising funds led to their supporting legislation in the 1980s to eliminate Regulation Q ceilings on time deposits and to allow checkable deposits that paid interest (NOW accounts). Although the ensuing changes helped to make banks more competitive in their quest for funds, the banks'

cost of funds rose substantially, reducing the cost advantage they enjoyed.

DIMINISHED INCOME (OR LOAN) ADVANTAGES

Banks have also experienced a deterioration in the income advantages they once enjoyed on the asset side of their balance sheets. The growth of the commercial paper and junk bond markets and the increased securitization of assets have undercut banks' traditional advantage in providing credit.

Improvements in information technology, which have made it easier for households, corporations, and financial institutions to evaluate the quality of securities, have made it easier for business firms to borrow directly from the public by issuing securities. In particular, instead of going to banks to finance short-term credit needs, many business customers now borrow through the commercial paper market. Total nonfinancial commercial paper outstanding as a percentage of commercial and industrial bank loans has risen from 5 percent in 1970 to more than 20 percent today.

The rise of money market mutual funds has also indirectly undercut banks by supporting the expansion of competing finance companies. The growth of assets in money market mutual funds to more than \$500 billion created a ready market for commercial paper because money market mutual funds must hold liquid, high-quality, short-term assets. Further, the growth in the commercial paper market has enabled finance companies, which depend on issuing commercial paper for much of their funding, to expand their lending at the expense of banks. Finance companies provide credit to many of the same businesses that banks have traditionally served. In 1980, finance company loans to businesses amounted to about 30 percent of banks' commercial and industrial loans; today these loans constitute more than 60 percent of banks' commercial and industrial loans.

The junk bond market has also taken business away from banks. In the past, only Fortune 500 companies were able to raise funds by selling their bonds directly to the public, bypassing banks. Now, even lower quality corporate borrowers can readily raise funds through access to the junk

bond market. Despite predictions of the demise of the junk bond market after the Michael Milken embarrassment, it is clear that the junk bond market is here to stay. Although sales of new junk bonds slid to \$2.9 billion by 1990, they rebounded to \$16.9 billion in 1991, \$42 billion in 1992, and \$60 billion in 1993.

The ability to securitize assets has made nonbank financial institutions even more formidable competitors for banks. Advances in information and data processing technology have enabled nonbank competitors to originate loans, transform these into marketable securities, and sell them to obtain more funding with which to make more loans. Computer technology has eroded the competitive

U.S. banks are not alone in losing their monopoly power over depositors. Financial innovation and deregulation are occurring worldwide.

advantage of banks by lowering transactions costs and enabling nonbank financial institutions to evaluate credit risk efficiently through the use of statistical methods. When credit risk can be evaluated using statistical techniques, as in the case of consumer and mortgage lending, banks no longer have an advantage in making loans.⁴ An effort is being made in the United States to develop a market for securitized small business loans as well.

U.S. banks have also been beset by increased foreign competition, particularly from Japanese and European banks. The success of the Japanese economy and Japan's high savings rate gave Japanese banks access to cheaper funds than were available to American banks. This cost advantage permitted Japanese banks to seek out loan business in the United States more aggressively, eroding U.S. banks' market share. In addition, banks from all major countries followed their corporate customers to the United States and often enjoyed a competitive advantage because of less burdensome regulation in their own countries.

Before 1980, two U.S. banks, Citicorp and BankAmerica Corporation, were the largest banks in the world. In the 1990s, neither of these banks ranks among the top twenty. Although some of this loss in market share may be due to the depreciation of the dollar, most of it is not.

Similar forces are working to undermine the traditional role of banks in other countries. The U.S. banks are not alone in losing their monopoly power over depositors. Financial innovation and deregulation are occurring worldwide and have created attractive alternatives for both depositors and borrowers. In Japan, for example, deregulation has opened a wide array of new financial instruments to the public, causing a disintermediation process similar to the one that has taken place in the United States. In European countries, innovations have steadily eroded the barriers that have traditionally protected banks from competition.

In other countries, banks have also faced increased competition from the expansion of securities markets. Both financial deregulation and fundamental economic forces abroad have improved the availability of information in securities markets, making it easier and less costly for business firms to finance their activities by issuing securities rather than going to banks. Further, even in countries where securities markets have not grown, banks have still lost loan business because their best corporate customers have had increasing access to foreign and offshore capital markets such as the Eurobond market. In smaller economies, such as Australia, which still do not have well-developed corporate bond or commercial paper markets, banks have lost loan business to international securities markets. In addition, the same forces that drove the securitization process in the United States are at work in other countries and will undercut the profitability of traditional banking there. Thus, although the decline of traditional banking has occurred earlier in the United States than in other countries, we can expect a diminished role for traditional banking in these countries as well.

HOW HAVE BANKS RESPONDED?

In any industry, a decline in profitability usually results in exit from the industry (often by widespread bankruptcies) and a shrinkage of market share. This occurred in the

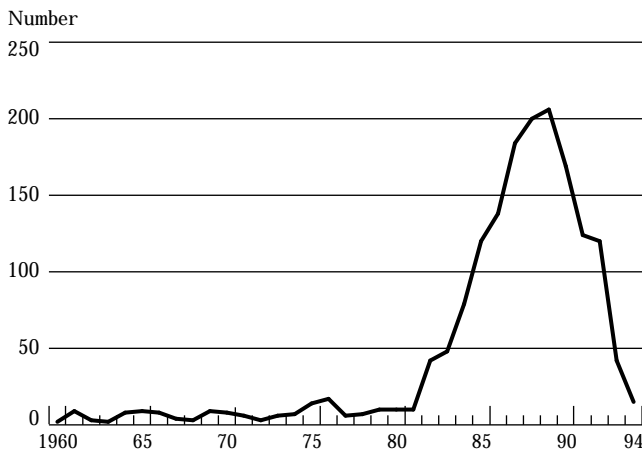
banking industry in the United States during the 1980s through consolidations and bank failures. From 1960 to 1980, bank failures in the United States averaged less than

To survive and maintain adequate profit levels, many U.S. banks are facing two alternatives. First, they can attempt to maintain their traditional lending activity by expanding into new, riskier areas of lending. . . . [Second, they can] pursue new, off-balance-sheet activities that are more profitable.

ten per year, but during the 1980s, bank failures soared, rising to more than 200 a year in the late 1980s (Chart 7).

To survive and maintain adequate profit levels, many U.S. banks are facing two alternatives. First, they can attempt to maintain their traditional lending activity by expanding into new, riskier areas of lending. For example, U.S. banks have increased their risk taking by placing a greater percentage of their total funds in commercial real

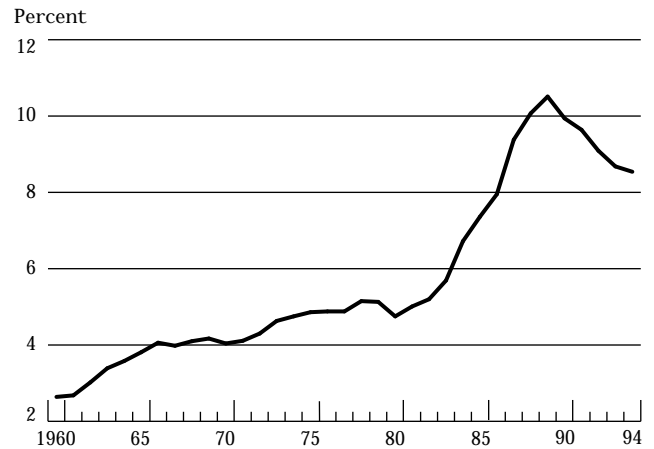
Chart 7
Bank Failures
1960-94



Sources: Federal Deposit Insurance Corporation, *1993 Annual Report and Quarterly Banking Profile*.

Chart 8

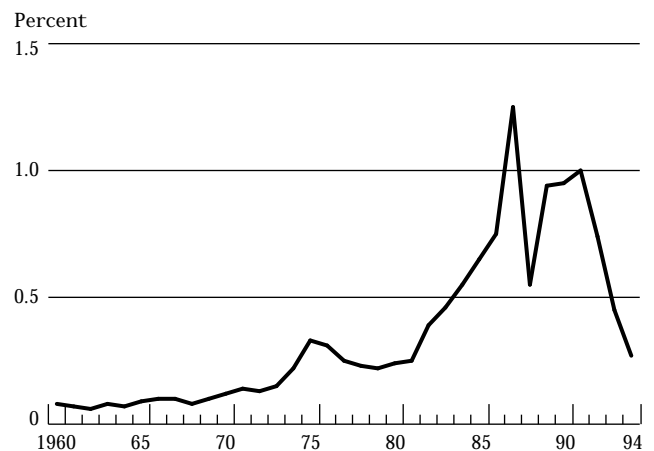
Commercial Real Estate Loans as a Percentage of Total Commercial Bank Assets
1960-94



Sources: Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin* and Flow of Funds Accounts.

estate loans, traditionally a riskier type of loan (Chart 8). In addition, they have increased lending for corporate takeovers and leveraged buyouts, which are highly leveraged transactions. There is evidence that banks have in fact increased their lending to less creditworthy borrowers. During the 1980s, banks' loan loss provisions relative to assets climbed substantially, reaching a peak of 1.25 per-

Chart 9
Loan Loss Provisions Relative to Assets
for Commercial Banks
1960-94



Sources: Federal Deposit Insurance Corporation, *Statistics on Banking and Quarterly Banking Profile*.

cent in 1987. Only with the strong economy in 1994 have loan loss provisions fallen to levels found in the worst years of the 1970s (Chart 9). Recent evidence suggests that large banks have taken even more risk than have smaller banks: large banks have suffered the largest loan losses (Boyd and Gertler 1993). Thus, banks appear to have maintained their profitability (and their net interest margins—interest income minus interest expense divided by total assets) by taking greater risk (Chart 10).⁵ Using stock market measures of risk, Demsetz and Strahan (1995) also find that before 1991 large bank holding companies took on more systematic risk than smaller bank holding companies.

The second way banks have sought to maintain former profit levels is to pursue new, off-balance-sheet activities that are more profitable. As Chart 4 shows, U.S. commercial banks did this during the early 1980s, doubling the share of their income coming from off-balance-sheet, noninterest-income activities.⁶ This strategy, however, has generated concerns about what activities are proper for banks and whether nontraditional activities might be riskier and result in banks' taking excessive risk. Although banks have increased fee-based activities, the area of expanding activities in nontraditional banking that has raised the greatest concern is banks' derivatives activities. Great controversy surrounds the issue of whether

banks should be permitted to engage in unlimited derivatives activities, including serving as off-exchange or over-the-counter (OTC) derivatives dealers. Some feel that such activities are riskier than traditional banking and could threaten the stability of the entire banking system. (We discuss this issue more fully later in the paper.)

The United States is not the only country to experience increased risk taking by banks. Large losses and

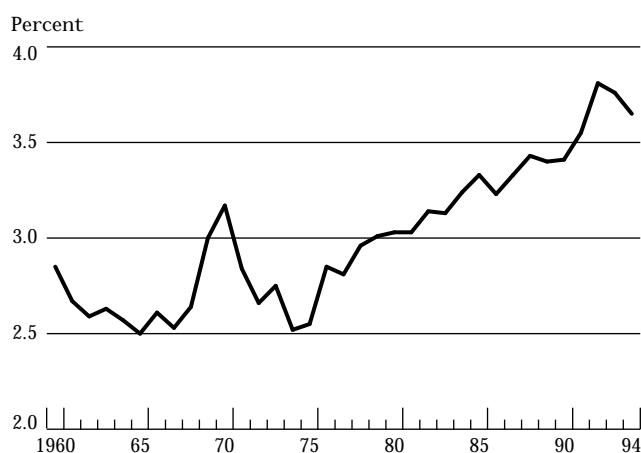
Much of the controversy surrounding banks' efforts to diversify into off-balance-sheet activities has centered on the increasing role of banks in derivatives markets.

bank failures have occurred in other countries. Banks in Norway, Sweden, and Finland responded to deregulation by dramatically increasing their real estate lending, a move followed by a boom and bust in real estate sectors that resulted in the insolvency of many large banking institutions. Indeed, banks' loan losses in these countries as a fraction of GNP exceeded losses in both the banking and the savings and loans industries in the United States. The International Monetary Fund (1993) reports that government (or taxpayer) support to shore up the banking system in Scandinavian countries is estimated to range from 2.8 to 4.0 percent of GDP. This support is comparable to the savings and loan bailout in the United States, which amounted to 3.2 percent of GDP.

Japanese banks have also suffered large losses from riskier lending, particularly to the real estate sector. The collapse of real estate values in Japan left many banks with huge losses. Ministry of Finance estimates in June 1995 indicated that Japanese banks were holding 40 trillion yen (\$470 billion) of nonperforming loans—loans on which interest payments had not been made for more than six months—but many private analysts think that the actual amount of nonperforming loans may be substantially larger.

Chart 10

Net Interest Margins for Commercial Banks
1960-94



Sources: Federal Deposit Insurance Corporation, *Statistics on Banking and Quarterly Banking Profile*.

French and British banks suffered from the worldwide collapse of real estate prices and from major failures of risky real estate projects funded by banks. Olympia and York's collapse is a prominent example. The loan-loss provisions of British and French banks, like those of U.S. banks, have risen in the 1990s. One result has been the massive bailout of Credit Lyonnais by the French government in March 1995. Even in countries with healthy banking systems, such as Switzerland and Germany, some banks have run into trouble. Regional banks in Switzerland failed, and Germany's BfG Bank suffered huge losses (DM 1.1 billion) in 1992 and needed a capital infusion from its parent company, Credit Lyonnais. Thus, fundamental forces not limited to the United States have caused a decline in the profitability of traditional banking throughout the world and have created an incentive for banks to expand into new activities and take additional risks.

BANKS' OFF-BALANCE-SHEET DERIVATIVES ACTIVITIES

Much of the controversy surrounding banks' efforts to diversify into off-balance-sheet activities has centered on the increasing role of banks in derivatives markets. Large banks, in particular, have moved aggressively to become worldwide dealers in off-exchange or OTC derivatives, such as swaps.⁷ Their motivation, clearly, has been to

replace some of their lost "banking" revenue with the attractive returns that can be earned in derivatives markets.

Banks have increased their participation in derivatives markets dramatically in the last few years. In 1994, U.S. banks held derivatives contracts totaling more than \$16 trillion in notional value.⁸ Of these contracts, 63 percent were interest rate derivatives, 35 percent were foreign exchange derivatives, and the remainder were equity and commodity derivatives.⁹ In addition, most of these derivatives were held by large banks, and were held primarily to facilitate the banks' dealer and trading operations (Table 2).¹⁰ In 1994, the seven largest U.S.-bank derivatives dealers accounted for more than 90 percent of the notional value of all derivatives contracts held by U.S. banks (Table 3).¹¹ The profitability of derivatives activities has clearly encouraged banks to step up their involvement: in 1994, derivatives accounted for between 15 and 65 percent of the total trading income of four of the largest bank dealers (Table 4).¹²

The increased participation of banks in derivatives markets has been a concern to both regulators and legislators because they fear that derivatives may enable banks to take more risk than is prudent. There can be little doubt that derivatives can be used to increase risk substantially,

Table 2
DERIVATIVES CONTRACTS
December 31, 1994

	Trading (\$ Billions)	Percentage of Total	Asset/ Liability Management (\$ Billions)	Percentage of Total	Total (\$ Billions)
BankAmerica	1,333	95	68	5	1,401
Bank One	0	0	45	100	45
Bankers Trust	1,982	98	44	2	2,026
Chase	1,293	95	67	5	1,360
Chemical	3,069	97	109	3	3,178
Citicorp	2,449	92	216	8	2,665
J.P. Morgan	2,180	88	292	12	2,472
NationsBank	485	95	26	5	511
Total/average ^a	12,791	94	867	6	13,658

Sources: Annual reports for 1994.

^a Totals, expressed in billions of dollars, appear in columns 1, 3, and 5. Averages, expressed as percentages, appear in columns 2 and 4.

Table 3
NOTIONAL/CONTRACT DERIVATIVES AMOUNTS OF FIFTEEN
MAJOR U.S. OVER-THE-COUNTER DERIVATIVES DEALERS
Millions of Dollars

Banks	
Chemical Banking Corporation	3,177,600
Citicorp	2,664,600
J.P. Morgan & Co., Inc.	2,472,500
Bankers Trust New York Corporation	2,025,736
BankAmerica Corporation	1,400,707
The Chase Manhattan Corporation	1,360,000
First Chicago Corporation	622,100
Securities firms	
Salomon, Inc.	1,509,000
Merrill Lynch & Co., Inc.	1,326,000
Lehman Brothers, Inc.	1,143,091
The Goldman Sachs Group, L.P.	995,275
Morgan Stanley Group, Inc.	843,000
Insurance companies	
American International Group, Inc.	376,869
General Re Corporation	306,159
The Prudential Insurance Co. of America	102,102
Total	17,852,239

Sources: Annual reports for 1994.

and can potentially be quite dangerous.¹³ In the last year, many banks sustained substantial losses on interest rate derivatives instruments when interest rates continued to rise. Because of the leverage that is possible, derivatives enable banks to place sizable “bets” on interest rate and currency movements, which—if wrong—can result in sizable losses. In addition, as dealers in OTC derivatives markets, banks may be exposed to substantial counterparty credit risk. Unlike organized futures exchanges, the OTC market offers no clearinghouse guarantee to mitigate the credit risk involved in derivatives trading. Finally, because derivatives are often complex instruments, sophisticated risk-control systems may be necessary to measure and track a bank’s potential exposure. Questions have been raised about whether banks are currently capable of managing these risks.

Concern about the growing participation of banks in derivatives markets is exemplified by the remarks of Representative Henry Gonzalez, Chairman of the Banking Committee of the House of Representatives:

I have long believed that growing bank involvement in derivative products is, as I say and repeat, like a tinderbox waiting to explode. In the case of many market innovations, regulation lags behind until the crisis comes, as it has happened in our case with S&Ls and banks. . . .

We must work to avoid a crisis related to derivative products before, once again, . . . the taxpayer is left holding the bag.¹⁴

In May 1994, Representative Gonzalez and Representative Jim Leach introduced the Derivatives Safety and Soundness Act of 1994. This bill directs the federal banking agencies to establish common principles and standards for capital, accounting, disclosure, and examination of financial institutions using derivatives. In addition, the bill requires the Federal Reserve and the U.S. Comptroller of the Currency to work with other central banks to develop comparable international supervisory standards for financial institutions using derivatives. In discussing the need for derivatives legislation, Representative Leach said, “one of the ironies of the development of [derivatives markets] is that while [individual firm] risk can be reduced . . . systematic risk can be increased.” A second problem, Leach noted, is that in many cases derivatives instruments “are too sophisticated for financial managers.”¹⁵ A further indication of these concerns is the plethora of recent studies that have examined the activities of financial institutions in derivatives markets. Studies have been conducted by the Bank for International Settlements (the “Promisel Report”), the Bank of England, the Group of Thirty, the Office of the U.S. Comptroller of the Currency, the Commodity Futures Trading Commission, and, most recently, the U.S. Government Accounting Office (GAO).

The GAO released its report, “Financial Derivatives: Actions Needed to Protect the Financial System,” in May 1994. The report concluded that there is some reason to believe that derivatives do pose a threat to financial stability. It raises the prospect that a default by a major OTC derivatives dealer—and in particular by a major bank—could result in spillover effects that could “close down” OTC derivatives markets, with potentially serious ramifications for the entire financial system. The GAO recommends that a number of measures be taken to strengthen government regulation and supervision of all participants in OTC derivatives markets, including banks.

The fear of a major bank failure because of OTC derivatives activities appears to stem from two sources. First, the sheer size of banks’ OTC derivatives activities suggests that they may be exposed to substantial market and credit risk because of their derivatives positions. In particular, there is concern that as OTC derivatives deal-

Table 4
CONTRIBUTION OF DERIVATIVES TRADING TO TOTAL TRADING INCOME

	1994 (\$ Millions)	Percent	1993 (\$ Millions)	Percent
Chase	108	15	201	28
Chemical	391	61	453	42
Citicorp	400	29	800	27
J.P. Morgan	663	65	797	39
Total/average ^a	1,562	42	2,251	34

Sources: Company annual reports.

^a Totals, expressed in millions of dollars, appear in columns 1 and 3. Averages, expressed as percentages, appear in columns 2 and 4.

ers, banks may be exposed to sizable counterparty credit risk. This concern has been heightened in recent months by the near-bankruptcy of Metallgesellschaft, Germany's fourteenth largest firm and a major end-user and counterparty in the swap market. Second, many fear that regulation, as well as managerial sophistication, has lagged developments in the derivatives area, and as a consequence, banks may be taking more risk than is prudent (and more than they even realize).

HOW RISKY ARE BANKS' OTC DERIVATIVES ACTIVITIES?

Much of the concern about banks' activities in derivatives markets has centered on their central position as major

dealers in the swap market. At year-end 1994, the notional value of all swap contracts outstanding was \$7.1 trillion (Table 5).¹⁶ Interest rate swaps represented 82 percent of this amount, with currency swaps making up most of the remaining contracts (Table 6). Although detailed information about the nature of these swap agreements is not available, the bulk of them are probably "plain vanilla" swaps—an exchange of fixed for floating rates. As such, these contracts are similar to "strips" of forward or futures contracts (for example, Eurodollar futures strips). Swaps are attractive to end-users because of their customized nature, low cost, and longer maturities.

As major dealers in the swap market, banks have extensive counterparty obligations and may be exposed to

Table 5
NOTIONAL/CONTRACT AMOUNTS FOR DERIVATIVES WORLDWIDE BY INDIVIDUAL PRODUCT TYPE
AS OF THE END OF FISCAL YEARS 1990-93

Type of Derivative	1990 (\$ Billions)	1991 (\$ Billions)	1992 (\$ Billions)	1993 (\$ Billions)	Percentage of Total 1993	Percentage Increase from 1990 to 1993
Forwards						
Forward rate agreements	1,156	1,533	1,807	2,522		
Foreign exchange forwards ^a	3,277	4,531	5,510	6,232		
Total forwards	4,433	6,064	7,317	8,754	35	97
Futures						
Interest rate futures	1,454	2,157	2,902	4,960		
Currency futures	16	18	25	30		
Equity index futures	70	77	81	119		
Total futures	1,540	2,252	3,008	5,109	20	231
Options						
Exchange-traded interest rate options	600	1,073	1,385	2,362		
Over-the-counter interest rate options	561	577	634	1,398		
Exchange-traded currency options	56	61	80	81		
Exchange-traded equity index options	96	137	168	286		
Total options	1,313	1,848	2,267	4,127	17	214
Swaps						
Interest rate swaps	2,312	3,065	3,851	6,177		
Currency swaps	578	807	860	900		
Total swaps	2,890	3,872	4,711	7,077	28	145
Total derivatives ^b	10,176	14,036	17,303	25,067	100	146
Total derivatives ^c	6,899	9,505	11,893	18,835		

Sources: Bank for International Settlements; U.S. Government Accounting Office; International Swaps and Derivatives Association; Federal Reserve Bank of New York.

^a Estimates for foreign exchange forward contracts are from U.S. Government Accounting Office 1994 (GAO report), Table IV.5. These also include an unknown amount of over-the-counter foreign exchange options.

^b Does not include complete data on physical commodity derivatives and equity options on the common stock of individual companies. Table IV.2 of the GAO report shows that seven of the databases contain equity and commodity derivatives that ranged from 1.1 to 3.4 percent of total derivatives' notional/contract amounts.

^c Before including GAO estimates for foreign exchange forwards and over-the-counter options.

substantial market and counterparty credit risk. The notional or principal amount of the swap contracts that banks hold, however, is not a good measure of the magnitude of their credit exposure. Unlike credit instruments such as loans and bonds, swaps and other derivatives transactions do not involve payments of principal amounts. Derivatives contracts require periodic payments based on notional amounts but not payments of the notional amounts themselves. For example, a swap of a variable interest rate for a 7 percent fixed rate on a \$10 million principal (notional) amount commits the swap parties to annual payments to each other on the order of \$700,000, with differences in future payments depending on how interest rates move in the future. A party's credit exposure, therefore, is not the notional value of the contract, as it is for a loan, but the "replacement cost" of the contract.¹⁷ Thus, the typical derivatives transaction involves a credit exposure that is only a fraction of its notional principal.

The GAO report closely examined fourteen major OTC derivatives dealers. Together, these dealers held derivative contracts with a notional principal of \$6.5 trillion as of year-end 1992. The "gross" credit exposure (or replacement cost) on these derivatives, however, was far less. The GAO estimated the replacement cost to be only \$114 billion, or about 1.8 percent of the dealers' \$6.5 trillion of notional outstandings.¹⁸

Table 6
NOTIONAL PRINCIPAL OF INTEREST RATE AND CURRENCY SWAPS WRITTEN ANNUALLY BY UNDERLYING AND OUTSTANDING
 Billions of U.S. Dollars

Type of Swap	1987	1990	1991	1992	1993
Interest rate swaps					
U.S. dollar	287	676	926	1,336	1,546
Deutsche mark	22	106	103	237	399
Yen	32	137	194	428	789
Others	47	345	397	821	1,370
Subtotal	388	1,264	1,622	2,822	4,104
Currency swaps					
Dollar	38	65	122	106	109
Nondollar	48	148	206	196	186
Subtotal	86	213	328	302	295
Total swaps written	474	1,477	1,950	2,124	4,399
Total swaps outstanding (at year-end)	867	2,890	3,872	4,711	7,077

Source: International Swaps and Derivatives Association.

In addition, this figure does not take into account the various risk-management mechanisms that banks use to limit counterparty exposure. Bilateral contractual netting provisions, which allow banks to offset losses with gains from other contracts outstanding with a defaulting party and its corporate affiliates, are common. Moreover, when swaps are undertaken with lower quality parties, such counterparties are usually required to post collateral on a mark-to-market basis. After taking these risk-reducing mechanisms into account, the GAO report estimated the

Properly measured, therefore, banks' credit-risk exposures associated with their OTC derivatives activities do not seem out of proportion to their other credit exposures, such as the exposure they have to defaults on their loan portfolio.

"net" credit exposure of the fourteen dealers to be only \$68 billion, or about 1 percent of the notional value of their outstanding derivatives contracts.

This credit exposure is managed by banks in a variety of ways. Internal credit limits are commonly used to diversify credit risk and to restrict the size of exposures to individual counterparties, industries, and countries. Most counterparties in swap transactions are required to have investment grade ratings,¹⁹ and credit "triggers" frequently require the automatic termination of a swap agreement if the credit rating of either party falls below a prespecified threshold (such as a single A rating).

To put banks' derivatives credit exposures in perspective, the derivatives exposures of bank derivatives dealers can be compared with credit exposures that the same banks face as a consequence of their loan portfolios.²⁰ For the seven largest U.S.-bank derivatives dealers, derivatives-related gross credit exposures as a percentage of bank equity were generally less than a fourth of their loan expo-

tures (Chart 11). Only Bankers Trust New York Corporation, which is probably the most active bank in derivatives markets, and J.P. Morgan had a gross derivatives credit exposure far in excess of their loan exposure. Although it is true that banks' credit exposure to derivatives is substantial—it exceeds 100 percent of the equity of all of the surveyed banks—a bank's capital would be wiped out by derivatives losses only if *all* counterparties were to default, there were no offsetting netting agreements or other risk-reduction mechanisms in force, and actual counterparty losses were identical to total credit exposures. Such assumptions are extreme, for loan defaults as well as for derivatives-related exposures.

Properly measured, therefore, banks' credit-risk exposures associated with their OTC derivatives activities do not seem out of proportion to their other credit exposures, such as the exposure they have to defaults on their loan portfolio. Banks also appear to be managing these derivatives-related exposures reasonably well. Indeed, the GAO reported that actual losses incurred by derivatives dealers as a result of counterparty defaults have been quite small: 0.2 percent of their combined gross credit exposure.²¹

Finally, derivatives activities can clearly be used by banks to increase their exposure to changes in interest rates and exchange rates—that is, to increase their market risk.

This kind of risk, however, is hardly new to banks. Banks have always been exposed to such risks because of their holdings of fixed-rate, long-term loans and securities, and because of their foreign operations and foreign currency positions. Derivatives can be used either to increase or decrease these risks. Consequently, like all other transactions that pose market risk, derivatives contracts must be managed prudently.

REGULATION OF BANKS' DERIVATIVES ACTIVITIES

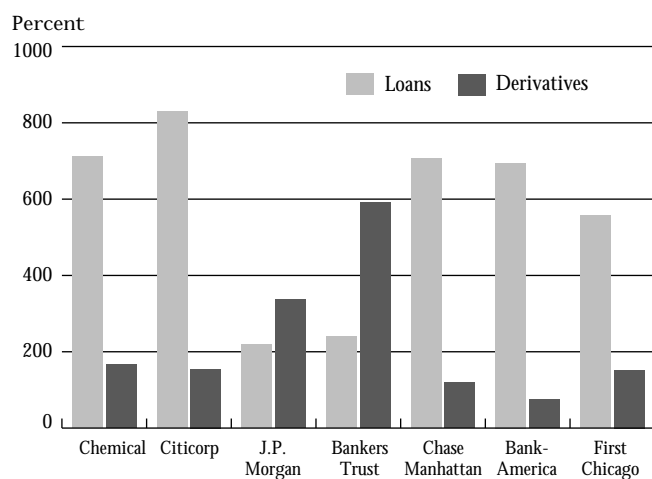
There has also been concern that banks may be taking excessive risk in their derivatives activities.²² Indeed, the GAO report suggests that there may be an intrinsic regulatory problem associated with banks' dealing in OTC derivatives:

The regulation of banks is essential, because they have deposit insurance and direct access to the Federal Reserve's discount window. At the same time, however, this combination of deposit insurance and access also can result in potential problems because it may induce the banks and their customers to inappropriately rely on such backing. Therefore, banks may be willing to run greater risks in their trading activities—in relation to their capital—than otherwise would be the case. In addition, market participants may prefer using banks for derivatives and related trading activities simply because banks are perceived to be safer counterparties. In the past, similar concerns caused us to recommend that nontraditional banking activities, such as those associated with underwriting and dealing in corporate debt and equity securities, be conducted only by well-managed and well-capitalized banks in separate subsidiaries of the bank holding company. Whether derivatives should be placed in this category depends on regulators' determinations on how they are being used by individual banks.²³

An important question, therefore, is whether banks' derivatives activities are so different from other bank activities that they cannot be effectively regulated. Is there something special about derivatives that makes pru-

Chart 11

Credit Exposures from Derivatives and Loans of Seven U.S. Banks as a Percentage of Equity, 1994



Sources: Bank annual reports for 1994.

dential regulation to protect the federal deposit insurance fund and taxpayers more difficult or even impossible? A key issue is whether bank capital requirements, the central component of prudential regulation, can be successfully applied to banks' derivatives activities. If not, there may be an argument for either prohibiting derivatives activities (or possibly dealer activities) or segregating them into separately capitalized bank affiliates.²⁴

Banks' derivatives activities are already subject to extensive prudential regulation. Both U.S. and Basle Accord capital requirements apply to U.S. banks' derivatives activities. U.S. banks are required to comply with two different types of capital requirements—a risk-based requirement and a leverage ratio requirement. The risk-based requirement applies to the credit risk associated with derivatives contracts or activities. The leverage ratio requires banks to hold capital as a cushion against losses arising from other risks associated with derivatives positions, such as operations risk. Not surprisingly, there is considerable controversy about whether these capital requirements are too low or too high.

The more important question, however, is whether *any* capital requirements on derivatives activities can successfully control banks' risk taking. Some argue that derivatives are so complex and so nontransparent that it is difficult for regulators to devise capital regulations to control banks' risk taking (or, for that matter, for the market to monitor banks' derivatives activities).

We are skeptical about this view. Although some derivatives instruments are undoubtedly complex, exposure to derivatives risk does not seem much different from exposure to many other bank activities, such as credit risk in a loan portfolio or interest rate risk in a variety of fixed-income securities. Banks can achieve high leverage in a number of ways other than through derivatives and can quickly change (or increase) their risk exposure in many different ways. While it is not clear how much capital should be required for a given derivatives risk exposure, these implementation problems are not unique to derivatives activities. All new bank activities are likely to present similar problems.

Thus, banks' recent push into derivatives activities

raises all of the questions commonly raised when banks engage in new off-balance-sheet activities. Are these activities too risky for banks? Do banks have the managerial capacity to engage in these activities in a safe way? Can these activities be effectively regulated? The challenges posed by these questions are no different for derivatives than they are for other banking activities.

IMPLICATIONS FOR POLICY

The decline of traditional banking presents a challenge to regulators and policymakers. On the one hand, banks may respond to their shrinking intermediary role and diminished profitability by taking greater risk, which, if unchecked, could undermine the stability of the banking system. There is some evidence that banks have in fact increased their risk taking, either by pursuing riskier strategies in their traditional business lines or by seeking out new and riskier activities. On the other hand, long-run financial stability would benefit from a restructuring of the banking industry that strengthens the competitive position of banks. Achieving this goal may require eliminating unnecessary (nonprudential) regulations and permitting banks to enter new markets and to engage in new activities.

One approach to achieving these dual objectives is to couple adequate capital requirements for banks with early corrective action by regulators to prevent capital from falling below specified levels.²⁵ Requiring banks to hold adequate capital promotes financial stability in two ways. First, it provides a greater cushion with which banks can absorb losses, lessening the likelihood of failure. Second, with more capital at risk, banks have less incentive to take excessive risk—they have more to lose if their bets go wrong. To ensure that banks hold the requisite amount of capital and do not engage in either excessively risky or illegal activities, supervision and field examinations of banks would continue to be necessary.²⁶ Requiring early corrective action by regulators to recapitalize a bank that has suffered an erosion in its capital promotes stability in three ways. First, it provides predictability for banks and bank shareholders. Certain regulatory actions predictably follow certain economic events. Second, it prevents a bank's capital from falling to levels that threaten losses to the bank insur-

ance fund. In addition, by requiring banks to maintain a positive net worth, it mitigates the moral hazard problem—banks will have something to lose by taking excessive risk. Lastly, early corrective action mitigates the regulatory forbearance problem by preventing regulators from using their discretion about whether or not to take action.²⁷

A benefit of this regulatory strategy is that regulation need no longer restrict banks' activities. As long as banks must hold sufficient capital against whatever activities they engage in, taxpayers will be protected and banks will have an incentive to avoid excessive risk taking. Further, freedom to offer additional products and

Public disclosure of banks' risk exposures would increase market efficiency and bolster market discipline. Banks should provide a meaningful depiction of the risks associated with their trading activities, both in derivatives and in on-balance-sheet securities, and of their ability to manage these risks.

services will better enable banks to compete with non-bank competitors and with foreign banks, and will make banks less susceptible to failure because they will be better diversified. (An example of such diversification benefits is casualty insurance, where losses are due principally to acts of god and have a very low correlation with the losses that banks typically incur, which are due primarily to adverse economic events.)

A key component of this approach is that bank risk exposures need to be measured accurately and capital requirements be set high enough to deter excessive risk taking. This requires, among other things, the adoption of market-value accounting principles for valuing bank assets and liabilities. Historical-cost accounting principles do not ensure that changes in the economic value of a bank's assets

and liabilities will be reflected in its true net worth. It is the market value of a bank's assets and liabilities, together with the market value of its equity capital, that determines a bank's economic solvency. Further, the market value of a bank's net worth is what the bank risks when it takes additional risk.

Objections to market-value-based capital requirements center on the difficulty of making accurate market-value estimates of assets and liabilities. Historical-cost accounting has an important advantage in that it is easier to value assets and liabilities. Market-value accounting, in contrast, requires estimates and approximations that are harder to justify and are often more expensive to obtain. Despite these difficulties, market-value accounting may still be able to provide a more accurate picture of a bank's economic condition. Clearly, an important research topic for regulatory authorities is the feasibility of applying market-value accounting principles to banking institutions.

Adoption of market-value accounting would have the additional advantage of making a bank's condition more transparent and therefore making regulators and politicians more accountable. Regulators and politicians are subject to a principal-agent problem: they often have an incentive to hide potential problems, even though taxpayers would be better off if these problems were dealt with sooner rather than later (or not at all). Market-value accounting would make it easier for taxpayers to monitor the actions of regulators and politicians, and would make it more difficult for regulators to engage in policies of forbearance.

Another important component of a regulatory strategy to maintain bank soundness is supervisory monitoring. Regulation must be able to keep banks from changing their risk exposure after capital requirements are determined. Both this element of regulatory supervision and the need for early intervention have increased in importance of late because of the emergence of derivatives markets that make it easier for banks to quickly take large bets on interest rate and other asset price movements. As we have learned from the recent collapse of Barings, regulators must also ensure that adequate internal controls are in place with regard to asset quality and risk management procedures.

Finally, public disclosure of banks' risk exposures would increase market efficiency and bolster market discipline. Banks should provide a meaningful depiction of the risks associated with their trading activities, both in derivatives and in on-balance-sheet securities, and of their ability to manage these risks. More public information about the risks incurred by banks will better enable stockholders, creditors, and depositors to evaluate and monitor banks, and will act as a deterrent to excessive risk taking. This view is consistent with a recent discussion paper issued by the Euro-currency Standing Committee of the G-10 Central Banks (1994), which goes so far as to recommend that estimates of financial risk generated by firms' own internal risk management systems be adapted for public disclosure purposes.²⁸ Such information would supplement disclosures based on traditional accounting conventions by providing information about risk exposures and risk management that is not normally included in conventional balance sheet and income-statement reports.

CONCLUSION

The decline of traditional banking entails a risk to the financial system only if regulators fail to adapt their pol-

icies to the new financial environment that is emerging. A constructive regulatory approach is to adopt a system of structured bank capital requirements together with early corrective action by regulators. An important element of this system is the adoption of market-value accounting principles for all financial institutions. In addition, supervisory monitoring and greater public disclosure by all financial institutions of the risks associated with their trading activities would be beneficial. Lastly, to enhance the competitiveness and efficiency of financial markets, banks could be permitted to engage in a diversified array of both bank and nonbank products and services. This general regulatory strategy, we believe, can successfully keep in check excessive risk taking by banks while providing the flexibility for both banks and regulators to restructure the banking system to achieve greater long-term stability. Finally, we do not view banks' off-balance-sheet activities, including their derivatives activities, as a threat to financial stability. Properly used and regulated, derivatives can facilitate the management of risk and increase the long-term viability of banks and the financial system.

ENDNOTES

1. Franklin R. Edwards is Arthur Burns Professor of Finance and Economics at the Graduate School of Business, Columbia University, and Visiting Scholar at the American Enterprise Institute. Frederic S. Mishkin is Executive Vice President and Director of Research at the Federal Reserve Bank of New York, Research Associate at the National Bureau of Economic Research, and A. Barton Hepburn Professor of Finance and Economics at the Graduate School of Business, Columbia University. An earlier version of this article appeared in Spanish in the June 1995 issue of *Moneda y Credito* as a part of the proceedings of the Symposium on Financial Instability. The research is part of the National Bureau of Economic Research's programs in Monetary Economics and Economic Fluctuations. Any opinions expressed are those of the authors and not those of Columbia University, the National Bureau of Economic Research, the American Enterprise Institute, the Federal Reserve Bank of New York, or the Federal Reserve System.

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2. Although many banks may be able to maintain their relative position as financial intermediaries by engaging in nontraditional banking activities, for policy purposes it is important to focus on the economic forces that have undercut the role of banking. Indeed, an important question is whether substantive public policy issues are raised by banks having to transform themselves into financial intermediaries that look more like nonbank financial intermediaries.

3. See also Edwards (1993).

4. Banks have also been engaged in the securitization process and, with the advent of higher bank capital requirements, have had greater incentives to move loans off balance sheet by securitizing them. Banks' involvement in the securitization process has been another contributing factor to the growth in their off-balance-sheet activities. Nevertheless, the basic point still stands: computer technology that can be used by nonbanking institutions to securitize assets has diminished the banks' competitive position.

5. U.S. banks have an incentive to take additional risk because of federal deposit insurance. Insured depositors have little incentive to monitor banks and to penalize them for taking too much risk. This moral hazard problem was compounded by our de facto "too-big-to-fail" policy for large banks. Although the 1991 Federal Deposit Insurance Corporation Improvement Act (FDICIA) has a least-cost resolution provision that makes it harder to bail out large depositors, there is an exception to the provision whereby a bank would be in effect declared too big to fail so

that all depositors would be fully protected if a two-thirds majority of both the Board of Governors of the Federal Reserve System and the Directors of the Federal Deposit Insurance Corporation as well as the secretary of the Treasury agreed. Thus, the moral hazard problem created by the too-big-to-fail policy has been reduced but not entirely eliminated by the 1991 FDICIA legislation.

6. Note that some off-balance-sheet activities that produce fee income, such as loan commitments and letters of credit, can be classified as traditional banking business. The data in Chart 4 overstate somewhat nontraditional banking business.

7. As of the third quarter, 1993, all insured commercial banks held interest rate swaps contracts with a notional value of \$2.79 trillion. See Bank Administration Institute and McKinsey & Company, Inc. (1994, p. 5).

8. Federal Reserve call report (RC-L) data for U.S. banks for the first quarter of 1992. See also U.S. General Accounting Office (1994, p. 182).

9. U.S. General Accounting Office (1994).

10. Salomon Brothers (1994, p. 8). Qualitative statements in the banks' annual reports suggest that much of their derivatives trading is customer-driven.

11. U.S. General Accounting Office (1994, p. 188, Appendix V, and p. 182, Appendix IV).

12. Salomon Brothers (1994, p. 9, Chart 5).

13. See Franklin R. Edwards (1994).

14. Remarks made on the floor of the House of Representatives, Congressional Record, June 18, 1993, H 3322.

15. Mark Kollar (1994, p. 1, col. 2).

16. This amount includes interest rate and currency swaps plus caps, floors, collars, and swaptions outstanding. Equity, commodity, and multi-asset derivatives are not included. The latter totaled \$131 billion at year-end 1992, relative to a total of \$4.7 trillion of swap contracts at year-end 1992. See Group of Thirty (1993, p. 58).

17. Measured at any point in time, credit risk exists only for counterparties with profitable positions. A losing counterparty has no credit risk. For example, assume that under an interest rate swap agreement, a firm receives fixed-interest payments and pays floating

ENDNOTES (*Continued*)

Note 17 Continued

rates. At the inception of this swap, the market value of the firm's position in the swap may be zero. If, subsequently, interest rates decline substantially, the firm will receive more than it will pay, so the firm will have a valuable or profitable position in the swap. This value, created by the change in interest rates, is the firm's replacement cost for the swap, and represents the credit risk to which it is exposed. If its counterparty defaults on future swap payments, the replacement cost is the cost to the firm of replacing the swap on the same favorable terms.

18. These include both swaps and forward contracts.

19. U.S. General Accounting Office (1994, p. 59, Table 3.1).

20. U.S. General Accounting Office (1994, pp. 54-55).

21. U.S. General Accounting Office (1994, p. 55).

22. For a review of the current regulation of banks' derivatives activities, see U.S. General Accounting Office (1994, pp. 69-84).

23. U.S. General Accounting Office (1994, p. 125).

24. Alternatively, there may be an argument for some form of "narrow banking," where the deposit-taking function of the bank is separated from other bank activities, such as derivatives activities.

25. This approach is discussed extensively in Benston and Kaufman (1988), elements of which are in the 1991 FDICIA act.

26. As Gorton and Rosen (1994) point out, corporate control (agency) issues may also contribute to excessive risk taking when traditional banking business declines. Thus, steps to control this agency problem may also be needed to control risk taking. What form these steps should take requires additional research and is beyond the scope of this paper.

27. As capital declined below certain "trigger" levels, for example, regulatory authorities would be required to take specific actions, such as restricting the ability of the bank to expand and preventing the bank from paying dividends and interest on subordinated debentures.

28. See also the Federal Reserve Bank of New York (1994), which is a companion piece to the Euro-currency Standing Committee's report.

REFERENCES

Bank Administration Institute and McKinsey & Company, Inc. 1994. "Banking Off the Balance Sheet."

Benston, George J., and George G. Kaufman. 1988. "Risk and Solvency Regulation of Depository Institutions: Past Policies and Current Options." New York University, Salomon Center for Graduate School of Business, Monograph Series in Finance and Economics, no. 1.

Boyd, John H., and Mark Gertler. 1993. "U.S. Commercial Banking Trends, Cycles, and Policy." In Olivier Blanchard and Stanley Fischer, eds., NATIONAL BUREAU OF ECONOMIC RESEARCH MACROECONOMICS ANNUAL.

———. 1994. "Are Banks Dead? Or, Are the Reports Greatly Exaggerated?" In THE DECLINING ROLE OF BANKING, pp. 85-117. Federal Reserve Bank of Chicago, May.

Demsetz, Rebecca, and Philip Strahan. 1995. "Historical Patterns and Recent Changes in the Relationship between Bank Holding Company Size and Risk." FEDERAL RESERVE BANK OF NEW YORK ECONOMIC POLICY REVIEW 1, no. 2 (July).

Edwards, Franklin R. 1993. "Financial Markets in Transition—or the Decline of Commercial Banking." In CHANGING CAPITAL MARKETS: IMPLICATIONS FOR MONETARY POLICY, pp. 5-62. Federal Reserve Bank of Kansas City, 1993.

REFERENCES (*Continued*)

- . 1995. "Derivatives Can Be Hazardous to Your Health: The Case of Metallgesellschaft." *DERIVATIVES QUARTERLY*, Spring: 8-17.
- Euro-currency Standing Committee of Central Banks of Group of Ten Countries (Fisher Group)*. 1994. "Public Disclosure of Markets and Credit Risks by Financial Intermediaries." Discussion paper, September.
- Federal Reserve Bank of New York*. 1994. "Public Disclosure of Risks Related to Market Activity." Discussion paper, September.
- Gorton, Gary, and Richard Rosen*. 1994. "Corporate Control, Portfolio Choice and the Decline of Banking." University of Pennsylvania, July. Mimeo.
- Group of Thirty*. 1993. "Derivatives: Practices and Principles," July, p. 58, Table 6.
- International Monetary Fund*. 1993. "The Deterioration of Bank Balance Sheets." Part II of *INTERNATIONAL CAPITAL MARKETS*, pp. 2-22. August.
- Kaufman, George*. 1994. "FDICIA: The Early Evidence." *CHALLENGE MAGAZINE*, July-August: 53-57.
- Kaufman, George G., and Larry R. Mote*. 1994. "Is Banking a Declining Industry? A Historical Perspective." *FEDERAL RESERVE BANK OF CHICAGO ECONOMIC PERSPECTIVES*, May-June: 2-21.
- Keeley, Michael C.* 1990. "Deposit Insurance, Risk, and Market Power in Banking." *AMERICAN ECONOMIC REVIEW* 80 (December): 1183-1200.
- Kollar, Mark*. 1994. "Congressman Sees Need for Safety Net." *KNIGHT-RIDDER FINANCIAL PRODUCTS & NEWS*, July-August, p. 1, col. 2.
- Salomon Brothers*. 1994. "Derivatives: New Disclosures Still Fall Short," May 16.
- U.S. General Accounting Office*. 1994. "Financial Derivatives: Actions Needed to Protect the Financial System." Report to Congressional Requestors, GAO/GGD-94-133, May.

