Perspective on the Credit Slowdown

*by Richard Cantor and John Wenninger**

The recent recession and recovery have been marked by an unusually sharp slowdown or outright decline in many measures of credit extension. As in past business cycles, a primary cause of the credit slowdown has been the reduction in credit demand related to the general weakness in economic activity. A broad range of considerations, however, suggests that not all of the slowdown is due to the weak economy alone, leading many financial commentators to identify the recent period as a "credit crunch." It appears that the decline in credit growth can be explained in part by changes in the attitudes toward debt by both lenders and borrowers. These changes in attitude seem to be the direct and perhaps inevitable consequences of the credit excesses of the 1980s.

Some perspective on the current credit crunch can be gained by reading accounts of earlier credit crunch episodes. Albert Wojnilower, in his 1980 historical review of credit crunches, leaves the reader with two generalities concerning credit crunches:

> Prolonged periods of intense inflation, speculation, monetary restraint, and rising interest rates set the scene, but whether and when a weak link in the credit chain may snap in a vital place remains very much a matter of accident.

> Credit crunch by private accident is much more dangerous than credit crunch by regulatory design or even error but ... as crunch by design is ruled out, crunch by accident becomes more probable.[1]

These two citations quite naturally raise the question whether the most recent credit slowdown was in some sense unique. At first glance, it does not seem that the scene for the current credit slowdown was set by "intense inflation, speculation, monetary restraint, and rising interest rates," although some elements of speculation were present in the corporate equity and real estate markets, and short-term interest rates did rise in the late 1980s when inflation showed some signs of increasing. Nor is it possible to point to a single "private accident" such as the failure of Penn Central in 1970 that might have precipitated the current credit slowdown. Finally, because Regulation Q ceilings are no longer in place and reserve requirements have been reduced as part of the monetary policy easing process, it is difficult to argue that the same kind of "regulatory design" that curtailed liquidity in earlier episodes was behind this credit slowdown.[2]

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[1] Albert Wojnilower, "The Central Role of Credit Crunches in Recent Financial History," *Brookings Papers on Economic Activity*, 1980 2, p. 293.

[2] Indeed, Wojnilower in later work argues that this latest credit slowdown was the result of the overly vigorous application of international bank capital standards that forced banks to cut back on lending, and hence did not follow the typical postwar pattern in many respects. See Wojnilower's entry on "credit crunch," article 0309, in Peter Newman et al., eds., *The New Palgrave Dictionary of Money and Finance* (New York: Stockton Press, 1992). A similar

In this paper, we attempt to analyze this latest credit slowdown from three different perspectives: (1) a review of the forces that set the stage for the credit slowdown, followed by a discussion of the available statistics on the credit slowdown period itself; (2) a comparison with previous postwar credit crunches; and (3) an overview of the credit cycle model found in the work of Fisher and Minsky. We find that at a very general level this latest episode does seem to fit the broad credit cycle model outlined by Fisher, Minsky, and others. However, it does differ in some important respects from earlier postwar credit crunch episodes. The set of forces that created this most recent slowdown in credit built up over a somewhat longer period of time and appeared to be driven more by inflationary expectations than by actual inflation. In addition, financial innovation and deregulation not only contributed to greater debt burdens, but also created an environment in which shifts in the demand for and supply of credit could create some new or different problems. At the same time, technological advances fostered more intense competition among financial intermediaries as more of their traditional customers gained direct access to the money and capital markets. Finally, regulatory error in deregulating the thrift industry without imposing adequate supervision also contributed to the current situation, although the lag between the regulatory event and the effect on credit was rather long, in part because of political considerations. Nonetheless, when the thrift crisis came to resolution, a more cautious lending environment became apparent and other financial intermediaries came under increased public and private scrutiny as the potential "next problem."

The paper's first section details the factors that created the fragile situation preceding the slowing of credit growth in 1989-90 and then describes the slowdown period itself. The second section reviews the available empirical evidence on the likely sources of the slowdown. The third section assesses (1) the extent to which better inventory management might have made bank lending look unusually weak from the demand side, and (2) whether the regulators contributed to the reduction in bank lending from the supply side. The fourth section compares this most recent credit slowdown with earlier episodes and also attempts to show how the current episode can be explained within the broad credit cycle process analyzed in the works of Fisher, Minsky, and others. We have also attached an appendix defining the various terms used to describe changes in credit conditions, such as credit slowdown, credit crunch, and credit rationing. We note here, however, that throughout the main part of this paper we use "credit slowdown" to refer to the combined effects of both supply factors and demand considerations (including shifts in borrowers' perceptions of the wisdom of high leverage), and "credit crunch" to encompass just the supply-side effects.

I. Historical account of the credit slowdown

Four key developments in the recent credit cycle contributed at times to shifts in both the supply of and the demand for credit: (1) deregulation and innovation, (2) over-investment in commercial real estate, (3) a massive buildup of debt, and (4) the savings and loan crisis. Because these factors are closely interrelated, it is necessary to weave a story of causes and effects among these factors that ultimately leads to the credit slowdown beginning in 1989.

All four of these factors have origins that can be traced, at least in part, to the high rates of inflation in the late 1970s, rates that had both immediate and longer term consequences. In the late 1970s and early 1980s the more immediate effect of the rapid inflation was a period of high short-term interest rates that seriously damaged the highly regulated thrift industry because of the mismatching of the maturities of assets and liabilities. Moreover, the high level of interest rates and their extreme volatility spurred an increased emphasis on financial innovation that lasted through much of the 1980s and prompted a move toward the deregulation of financial intermediaries.[3]

The longer run effects of the high inflation of the late 1970s seemed to come through expectations based on the seemingly inevitable upward creep of inflation through the 1960s and 1970s and on a trend of higher peak rates of inflation in each successive business cycle. These developments made it seem reasonable to expect that high inflation could return at some time during the 1980s (Chart 1). Indeed, for much of the 1980s, real interest rates, calculated using actual rates of inflation, appeared extremely high, suggesting that long-term investors in financial instruments suspected that inflation might accelerate as it had done in previous expansions after abating temporarily during the reces-

Footnote 2 continued
view was taken by Richard Breeden and William Isacc in "Thank Basel for Credit Crunch," *Wall Street Journal*, November 4, 1992. Federal Reserve Chairman Alan Greenspan, by contrast, argues that this is too narrow an explanation and that other demand and supply factors probably were more important than the risk-based capital requirements. For more detail, see Greenspan, remarks before the Tax Foundation of New York, November 18, 1992.

[3]More detailed reviews of financial developments in the 1980s can be found in Thomas Simpson, "Developments in the U.S. Financial System Since the Mid-1970s," *Federal Reserve Bulletin*, January 1988; and M.A Akhtar and Betsy Buttrill White, "The U.S. Financial System: A Status Report and a Structural Perspective," in C. Imbriani, P. Roberti, and A. Torrisi, eds., *Il Mercato Unico Del 1992: Deregolamentazione E Posizionamento Strategico Dell'Industria Bancaria in Europa* (Rome: Bancaria Editrice, 1991), pp 515-42.

sions (Charts 1 and 2).

A high-inflation psychology, along with innovative debt instruments, increased the willingness and the ability of households and businesses to take on large amounts of debt and made investment in real estate and corporate equity appear highly attractive for investors.[4] In addition, the 1981 tax law on passive losses and accelerated depreciation often made investment in commercial real estate profitable on an after-tax basis, even if buildings would not be fully, or even partially, rented.[5]

These conditions also prompted lenders to switch from credit standards based on current cash flow and balance sheet strength to standards based on anticipated growth in cash flow or collateral price appreciation. Given the intense competition for earnings among financial intermediaries domestically and internationally, real estate on the East and West Coasts was in a boom phase that made this change in lending practices appear rational.

A relaxation of credit standards was also apparent for commercial lending that was not related to real estate. In the early and mid-1980s, takeover artists identified

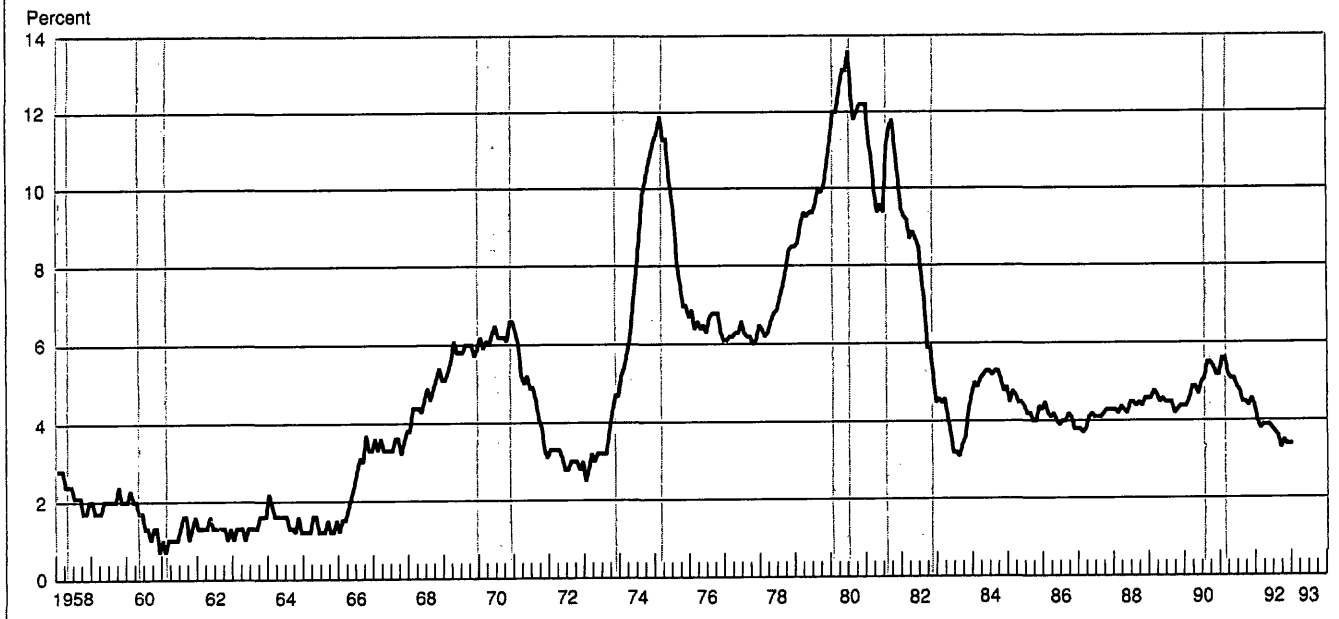
[4]Henry Kaufman has also argued that inflation (or inflationary expectations) is, by itself, too simple an explanation for the rapid growth of debt in the 1980s. He also notes the importance of a shift in attitude toward debt, financial innovation (including securitization), deregulation, financial internationalization, the tax structure, and the practice of debt prudence. Kaufman's views are summarized in "Debt: The Threat to Economic and Financial Stability," in *Debt, Financial Stability and Public Policy*, Federal Reserve Bank of Kansas City, 1986, pp. 15-26, and presented in more detail in Henry Kaufman, *Interest Rates, the Markets, and the New Financial World* (New York: Times Books, 1986). Apparently, however, not everyone is convinced by such arguments. Benjamin Friedman takes the position that "at least for the present, therefore, the most honest answer of why all this [debt acceleration] has happened *in the 1980s* is that nobody really knows." See Benjamin Friedman, "Changing Effects of Monetary Policy on Real Economic Activity," in *Monetary Policy Issues in the 1990s*, Federal Reserve Bank of Kansas City, 1989, p. 70.

[5]For a detailed analysis of the tax law changes, see James Poterba, "Tax Reform and the Housing Market in the Late 1980s: Who Knew What, and When Did They Know It?" in *Real Estate and the Credit Crunch*, Federal Reserve Bank of Boston, 1992. For an analysis of why real estate is susceptible to strong cycles even in the absence of tax incentives or disincentives, see Lynn Browne and Karl Case, "How the Commercial Real Estate Boom Undid the Banks," in *Real Estate and the Credit Crunch*. These authors refer to the real estate cycle as a "hog cycle"—that is, "overbuilding caused by an inelastic short run supply curve and elastic long run supply curve," combined with multiyear leases that distort price information.

Chart 1

Consumer Price Index Excluding Food and Energy

Change from Twelve Months Earlier



Source: U.S. Department of Commerce

Note: Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

companies with undervalued assets. These companies could be acquired with borrowed money and then sold back to the market at a profit. The maturing of the junk bond market and early leveraged buyouts propelled stock prices even higher, fulfilling the expectations of lenders that had placed their bets on asset price appreciation. By 1987 and 1988, buyouts were being transacted at prices so high that defaults would be inevitable unless assets could be sold off at inflated prices within a few years.[6] The public's faith in leverage also spread to the investment grade sector as many blue-chip corporations undertook enormous stock buyback programs.[7]

At the same time, competition among financial intermediaries intensified as advances in information technology reduced the advantage banks had held in making some types of loans, especially loans to highly rated corporations. As a result, banks—under pressure since the early 1980s because of poor earnings stemming from losses on less developed country (LDC) and energy loans—seemed almost overeager to make real estate loans and loans for highly leveraged transactions as their traditional high-quality business borrowers began to develop innovative ways to access the money markets directly and as nonbank lenders began to compete intensely for this component of the banking system's lending business and others.

Consequently, banks were not alone in extending large amounts of credit to finance commercial real estate investment and leveraged buyouts. Other intermediaries such as insurance companies and thrift institutions also lent large sums for these transactions. Insurance companies, it appears, became involved in junk bonds and real estate because of the need to earn higher yields after the deregulation of bank and thrift deposits created more competition for consumer savings.[8] In this environment, consumers unbundled the

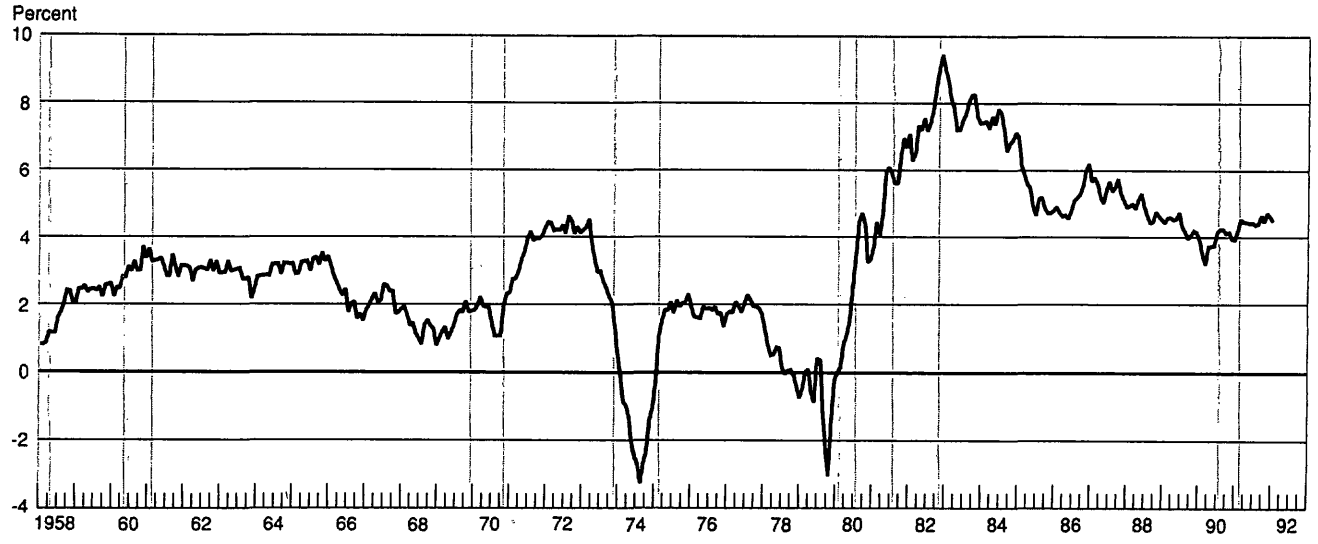
[6]The decline in credit quality of new-issue junk bonds and the trend towards merger-related transactions that entailed interest coverage below one are examined by Barrie Wigmore in "The Decline in the Credit Quality of Junk Bonds," *Financial Analysis Journal*, September-October, 1990, pp 53-62

[7]During the 1980s, the average cash flow coverage and leverage ratio deteriorated even within credit rating bands For example, in the early 1980s, the median AAA corporation had a pretax interest coverage (including rents) of 8 38 percent and a total debt-to-capitalization ratio of 25 6 percent By the end of the decade, these ratios were 4 79 and 35 3 percent, respectively See Standard and Poor's Corporation, *Corporate Finance Criteria*, 1991, p 68

[8]For more background on the insurance industry, see Richard Kopcke and Richard Randall, eds , *The Financial Condition and Regulation of Insurance Companies*, Federal Reserve Bank of Boston, June 1991 For a more recent overview of the real estate

Chart 2

Real Aaa Corporate Bonds



Sources: Moody's Investor Service; U.S. Department of Commerce

Note. Chart shows Aaa corporate bond rate less percentage change in consumer price index (excluding food and energy) from twelve months earlier Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

insurance and savings components of whole life policies, prompting insurance companies to offer innovative products such as guaranteed investment contracts at interest rates reflecting market rates. Insurance companies also became active in the large-dollar pension fund annuity market, where they were required to pay highly competitive rates of return. As a result of these innovations and deregulation, insurance companies engaged in riskier lending in the 1980s than had been their practice earlier.

Likewise, many thrift institutions became active in risky commercial lending during the 1980s, but these institutions had little or no experience with such lending or with investing in some of the new instruments developed in the 1980s. The regulatory response to the weakened state of the thrift industry following the extremely high and volatile interest rates of the late 1970s and early 1980s had been to deregulate both the asset and liability sides of thrift balance sheets. Capital requirements, however, were not increased to reflect the greater risks thrifts could assume, or to reflect their inexperience in these new types of lending. Indeed, exempting weak thrifts from capital standards became common practice. As a result, the relative ease of entry into the thrift industry, combined with (1) the ability to finance a rapidly growing volume of risky real estate and other loans with government-insured deposits, and (2) decreasing amounts of regulatory oversight, produced the thrift crisis of the late 1980s.

Here again, financial innovation played a key part. On the liability side, brokered deposits, issued in insured units of $100,000 through a national brokerage market, enabled weak thrifts to tap the national money market with a managed liability. On the asset side, the high yields on junk bonds seemed very attractive to recently deregulated thrifts; at the same time, it became relatively easy to originate and sell mortgage loans, the traditional thrift asset, reducing the need for a specialized home mortgage lender.[9]

In general, for much of the 1980s the return to a high inflation environment seemed likely, and increased leverage, made easier by financial innovation, appeared to be a successful strategy. The value of certain assets—primarily commercial and residential real estate and stock prices—continued to increase, and inflation more generally seemed to be stuck in the 4 to 5 percent range, creating doubts about the resolve of the Federal Reserve to maintain its stated goal of reducing inflation over time through monetary control. The massive budget deficits of the 1980s also made investors uneasy about the prospects for continued progress toward greater price stability. Hence, during the 1980s, (1) heavy debt burdens, (2) weakened financial intermediaries, (3) an overdeveloped commercial real estate market, and (4) a crisis brewing in the thrift industry combined to create a rather fragile economic and financial environment in which both demand and supply factors could create a sharp slowdown in credit. In a sense, the process seemed to be a more or less direct result of earlier developments, and in some respects followed the Fisher-Minsky credit cycle discussed below.

By the late 1980s, expectations of further asset price increases began to appear unfounded, and in many markets real estate values were declining. A large supply of new buildings came on the market at about the same time that it became clear that the financial services industry was going through a sharp retrenchment. The stock market crashed in late 1987 and stalled for a period thereafter, and by the end of the decade the wisdom of some of the highly leveraged takeovers was very much in doubt from the perspective of both borrowers and lenders. The stock market experienced a smaller "crash" in late 1989, and the junk bond market collapsed when the deal for United Air Lines failed to come off. In addition, by the late 1980s, the thrift industry was going through a massive downsizing, and consumers and corporations were overextended with debt burdens made possible in part by the financial innovations developed during the 1980s. Moreover, with the onset of the recession, it began to appear that inflation was not likely to accelerate, as had been feared throughout much of the 1980s. Indeed, inflation showed signs of decelerating, making the debt burdens an even greater source of discomfort and prompting borrowers to take steps to reduce their dependence on credit. Finally, many of the tax incentives that had made commercial real estate investments profitable were removed, in many cases not only for new projects but existing projects as well. In short, the necessary elements of a sharp slowdown in credit from both the demand and the supply sides were all in place, and the recession and the credit slowdown fed on each other to produce a prolonged period of weakness in the U.S. economy. Under such circumstances, the unwinding of the excessive credit growth was bound to have both cyclical and systemic consequences.[10]

Footnote 8 continued
market and banks, insurance companies, and thrifts, see Donald Hester, "Financial Institutions and the Collapse of Real Estate Markets," in *Real Estate and the Credit Crunch*

[9]For more detail on the thrift crisis, see Edward Kane, *The S&L Mess: What Really Happened?* (Boston, Mass. MIT Press, 1985), and Lawrence White, *The S&L Debacle: Public Lessons for Bank and Thrift Regulation* (New York Oxford University Press, 1991).

[10]Variations on this theme occurred in other countries. For more detail, see Susan Phillips, "Structure Shifts in the U.S. Economy," remarks at Widener University, Chester, Pennsylvania, October 1992;

Real estate problems in the Southwest had been evident as early as the mid-1980s Real estate lending had been strong in that region, and the real estate market became overbuilt when the energy industry shifted from expansion into contraction. Banks in the region took losses first on their loans to the energy industry and subsequently on real estate lending. Next, the New England economy entered a recession in 1989, and many real estate projects that were based on continued strong growth in the regional economy were no longer viable. The collapse in New England real estate in turn added to the downward momentum of the regional economy. Problems with real estate loans soon became apparent in the entire Northeast, the East Coast more generally, and finally the West Coast By the end of 1990, a large part of the nation's banking system was affected to some degree by the contraction of real estate values. The banking system was also hurt, though to a lesser extent, by problem loans for highly leveraged transactions as the recessionary environment caused some of the more marginal deals to prove less profitable than expected.[11]

Financial intermediaries and their regulators adjusted to the changing economic environment of the late 1980s and early 1990s. First, as regulators began to realize the seriousness of the real estate situation following the problems in the Southwest, they focused more on real estate loans in their exams and criticized loans whose collateral values had fallen, making full repayment improbable. Second, the pace of economic activity began to slow sharply, causing lenders to reassess the riskiness of certain types of loans, particularly for those firms and consumers that had acquired heavy debt burdens during the 1980s. Third, banks were obliged to increase their loan loss reserves for a growing volume of classified assets, and therefore had less capital available to finance asset expansion. Finally, the thrift crisis of the late 1980s seemed to make banks more cautious in their lending as the consequences of lax lending standards became more apparent, especially since the banking industry had already been weakened by a series of earlier losses on LDC loans, energy credits, and agricultural loans. In this sense, the thrift industry may indirectly have contributed to the reduced willingness of banks to lend over the 1989-91 period by focusing attention on where the "next problem" might emerge among the financial intermediaries. All four of these adjustments were necessary, and by themselves they did not necessarily constitute a "credit crunch," but they did clearly contain elements of supply-side adjustments [12]

At the same time, a substantial amount of adjustment took place on the demand side as well The slower pace of economic activity and a more cautious attitude among borrowers combined to reduce the demand for credit In addition, the abatement of inflationary pressures also seemed to prompt consumers and businesses to reassess the general wisdom of the heavy debt burdens accumulated during the 1980s, even as their ability to refinance this debt at lower rates seemed to alleviate the burden somewhat

II. Evidence on the sources of the credit slowdown

In this section we survey the available empirical evidence on the nature and the extent of the 1989-91 credit slowdown. We begin with a brief review of the aggregate credit flows and then turn to specific markets and institutions.

A. Overview of aggregate credit trends

Table 1 shows the broad credit flows over the 1960-91 period, with the time since 1980 broken into three-year intervals to capture some of the shifting trends during the 1980s. From 1960 to 1979, total debt increased at about the same rate as GDP, while depository credit grew about 1.0 percentage point more rapidly than GDP. During the period 1980-82, these trends began to change. Total debt accelerated and began to grow more rapidly than GDP, while depository credit—primarily at thrift institutions—slowed sharply as home mortgage lending came to a virtual halt. But as the economic recovery progressed and consumers and corporations became more willing to take on debt, total debt as well as bank and thrift credit accelerated sharply. In the

Footnote 10 continued
and E Gerald Corrigan, remarks at the Seventh International Conference of Bank Supervisors, Cannes, France, October 8, 1992 In several other countries, excessive debt burdens, financial innovation and integration, and speculation in real estate led to a sharp slowdown in debt growth relative to GDP and gave rise to financial strains

[11]A more detailed discussion of the problems encountered by banks during the 1980s can be found in the testimony of John LaWare before the Senate Committee on Banking, Housing, and Urban Affairs, June 10, 1992 A convenient way to review the banking system's evolution during the 1980s is to read the annual review of trends in banking that appears in the *Federal Reserve Bulletin* under the title "Recent Developments Affecting the Profitability and Practices of Commercial Banks "

[12]Several studies using a cross sectional approach have shown a relationship between bank capital ratios and deposit or loan growth, suggesting that the difficulties banks encountered in the late 1980s affected their willingness to lend or their ability to fund loans For more detail, see Ronald Johnson, "The Bank Credit Crumble," Federal Reserve Bank of New York *Quarterly Review*, Summer 1991, pp 40-51, and Herbert Baer and John McElravey, "Capital Adequacy and the Growth of U S Banks," Federal Reserve Bank of Chicago, working paper, May 1992 Also see Ben Bernanke and Cara Lown, "The Credit Crunch," *Brookings Papers on Economic Activity*, 1992 2, pp 205-39, and Joe Peek and Eric Rosengren, "The Capital Crunch in New England," Federal Reserve Bank of Boston *New England Economic Review*, May-June 1992, pp 21-31

1983-85 period, the growth of total debt exceeded GDP by 4 percentage points, depository credit growth exceeded GDP by 2 percentage points, and nondepository credit exceeded GDP growth by almost 6 percentage points. This acceleration in credit during the period 1983-85 was unprecedented. In recent years (1986-91), nondepository credit growth continued to exceed GDP growth by a wide margin (4 5 to 5 5 percentage points). Depository credit, on the other hand, decelerated sharply as thrift credit went into an outright decline in the 1989-91 period. Relative to the peak growth rates of the 1983-85 period, total debt decelerated 7 0 percentage points, nondepository credit about 4 5 percentage points, and depository credit 11 percentage points [13] Bank lending, however, slowed considerably less, by about 6 percentage points The slowing in GDP, at about 4 5 percentage points, was more moderate, suggesting that cyclical demand factors cannot explain all of the slowdown in credit between these time periods

The trends in bank and thrift credit, as indicators of the supply of and demand for credit, have been dis-

[13]For alternative reviews of recent credit flows, see Fred Furlong, "Financial Constraints and Bank Credit," Federal Reserve Bank of San Francisco *Weekly Letter*, May 24, 1991, Steven Strongin, "Credit Flows and the Credit Crunch," *Chicago Fed Letter*, Federal Reserve Bank of Chicago, November 1991, and Robert Parry, "The Problem of Weak Credit Markets A Monetary Policymaker's View," Federal Reserve Bank of San Francisco *Weekly Letter*, January 3, 1992

Table 1

Credit Flows, 1960-91

Average Growth Rates

	Nominal GDP (1)	Total Debt (2)	Private Debt (3)	GDP less Total Debt [(1)-(2)] (4)	Depository Credit (5)	Bank Credit (6)	Bank Lending (7)	Thrift Credit (8)	Nondepository Credit (9)	GDP less Nondepository Credit [(1)-(9)] (10)
1960-79	8 6	8 3	9 4	0 3	9 6	9 3	10 5	10 1	7 2	1 4
1980-82	7 6	9 3	8 3	−1 7	6 3	7 6	6 6	3 9	12 5	−4 9
1983-85	9 1	13 1	12 2	−4 0	11 1	9 9	10 0	13 0	14 9	−5 9
1986-88	6 8	10 0	10 1	−3 1	8 1	7 4	8 9	9 3	11 5	−4 7
1989-91	4.5	6 2	5 2	−1 7	0 0	4 7	4 1	−9 1	10 4	−5 9

Sources Board of Governors of the Federal Reserve System, Flow of Funds Accounts, U S Department of Commerce

Table 2

Ratio of Debt to GDP

	Total	Growth	Business	Growth	Household	Growth	State and Local Government	Growth	Federal Government	Growth
1979	1 388	2 0	0 523	3 8	0 493	4 8	0 116	−3 9	0 255	−3 5
1980	1 389	0 1	0 524	0 1	0 496	0 6	0 110	−5 7	0 259	1 7
1981	1 395	0 4	0 533	1 7	0 491	−1 0	0 106	−3 7	0 265	2 1
1982	1 476	5 8	0 556	4 3	0 501	1 9	0 112	5 9	0 307	16 0
1983	1 486	0 7	0 549	−1 3	0 498	−0 6	0 110	−1 2	0 329	7.1
1984	1 560	5 0	0 581	6 0	0.515	3 5	0 110	0 0	0 353	7 2
1985	1 675	7 4	0 607	4 4	0 548	6 5	0 136	22 7	0 384	8 9
1986	1 803	7 6	0 647	6 7	0 596	8 6	0 143	5 5	0 416	8 4
1987	1 826	1 3	0 648	0 1	0 611	2 5	0 150	5 0	0 416	−0 0
1988	1 847	1.2	0 651	0 4	0 630	3 1	0 149	−0 7	0 417	0 2
1989	1 887	2 2	0 657	1 0	0 656	4 2	0 153	2 3	0 421	0 9
1990	1 935	2 5	0 651	−1 0	0 680	3 6	0 155	1 8	0 449	6 6
1991	1 947	0 6	0 625	−3 9	0 682	0 4	0 157	1 0	0 483	7 4
1992	1 938	−0 4	0 595	−4 9	0 681	−0 2	0 156	−0 4	0 506	5 0

Sources Board of Governors of the Federal Reserve System, Flow of Funds Accounts, U S Department of Commerce

Note Ratios are calculated as of the fourth quarter of each year

torted by several developments over the last decade. The decline in thrift credit probably does not have economic consequences commensurate with its size With a large share of single family mortgages being securitized and sold in the capital markets, mortgage money has remained readily available to consumers at market rates (at different times with easier or tighter documentation) even as the thrift industry has downsized In addition, in the case of failed thrifts, the remaining assets are either being funded and held by the Resolution Trust Corporation or have been sold to banks or other financial intermediaries and investors

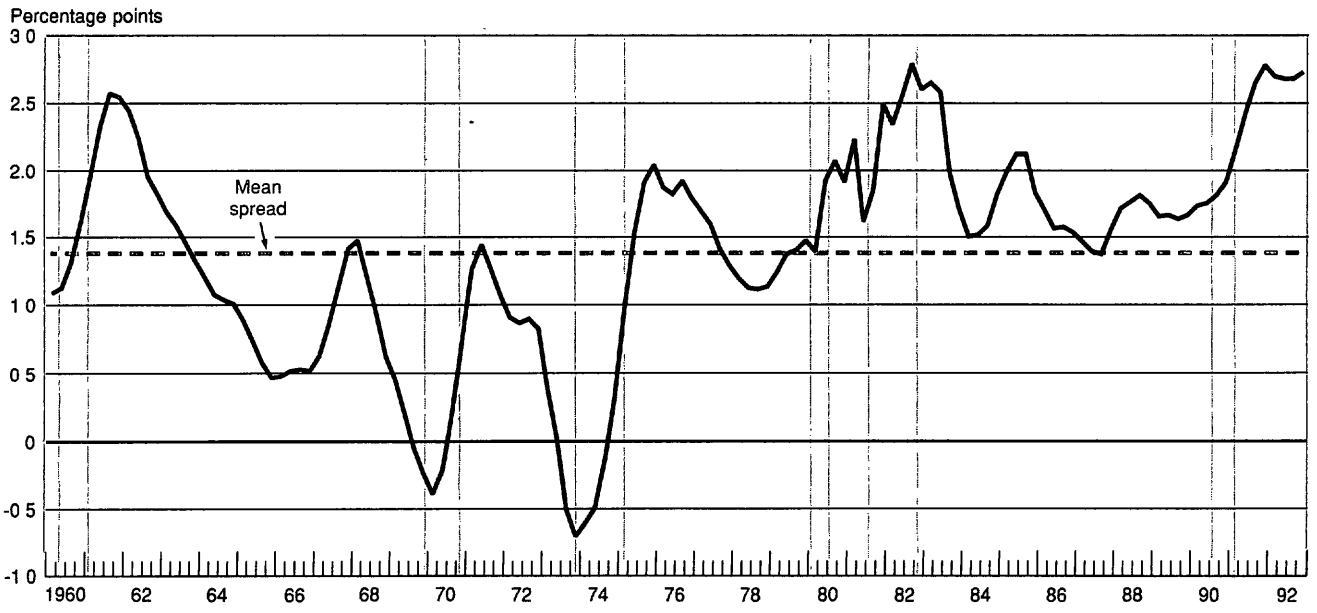
Similarly, banks have securitized a large fraction of their assets in recent years. As a result, bank credit did not accelerate nearly as much as total debt during the 1980s, and the slowdown in bank credit in the late 1980s probably understated the availability of bank-originated credit. Moreover, the continued rapid growth of nondepository credit relative to GDP suggests that much more credit is flowing outside the banking system (or is at least held outside the banking system) than in the past

Table 2 shows the buildup in debt during the 1980s relative to GDP by class of borrower. In Table 2, as in Table 1, the increase in total debt outstanding was concentrated in the 1984-86 period. During this period, households, businesses, and government borrowed large sums relative to GDP. For the federal government, the rapid increase in debt began two years earlier, in 1982. After 1986, the increase in debt relative to GDP slowed dramatically. In the business sector, debt declined relative to GDP during the last three years Household debt, relative to GDP, continued to grow at a fairly rapid rate until 1990, but slowed sharply in 1991. Because of the recession and the thrift bailout, the federal government had a rapid buildup in debt relative to GDP over the 1990-91 period. Compared with the ratios of debt to GDP that prevailed in 1979, total debt relative to GDP is now 40 percent greater, business debt 13 percent greater, household debt 39 percent greater, state and local government debt 35 percent greater, and the federal government's debt 98 percent greater Clearly, the buildup in debt relative to GDP has occurred in all sectors of the U.S. economy, and neither the buildup during the 1980s nor the subsequent slowdown appears to be wholly attributable to changes in

Chart 3

Prime Rate less Federal Funds Rate

Four-Quarter Moving Average



Source Board of Governors of the Federal Reserve System

Note Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

the pace of economic activity.[14] That is, while cyclical demand factors have clearly figured importantly in the credit slowdown, there has been opportunity for shifts in the demand and supply of credit to play a role as well, particularly in the business sector. Next, we look more carefully at the evidence on the credit slowdown from the perspective of the bank and nonbank intermediaries and the bond and commercial paper markets

B. The banking industry

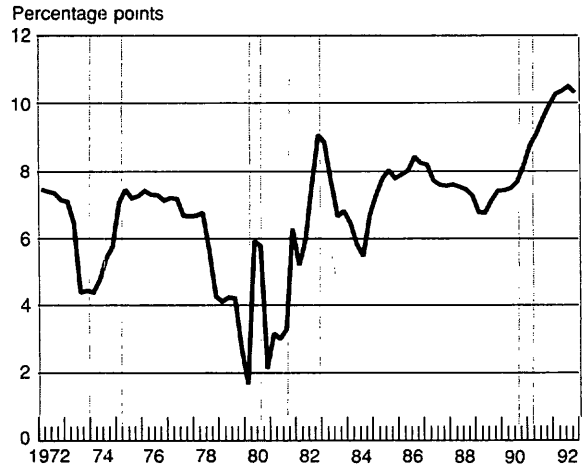
Over the past three years, analysts have pointed to several indicators of a credit crunch in the banking sector Two of the most frequently cited indicators have been the wide spreads between bank lending rates and bank funding costs in both the corporate and consumer sectors (Charts 3 and 4). Both of these rate spreads are close to or above the record levels of earlier credit crunch periods, suggesting a reduced willingness on the part of banks to lend. In other words, if the weak credit growth was entirely demand driven, we would expect to see these rate spreads narrow as banks cut loan rates relative to funding costs to attract new business. Hence, these rate spread charts tend to provide some weak evidence that the lending slowdown at banks was supply driven at least in part.

Survey results also have been consistent with the notion that banks were less willing to lend during this period (Charts 5, 6, 7, 8, and 9). Both lenders and borrowers reported tighter credit standards, particularly in the 1990-91 period These tighter credit standards applied to firms of all sizes and were imposed on commercial and industrial (C&I) loans, commercial real estate loans of all types, and land and development loans. In addition, the tighter standards were generally in line with those of earlier credit crunch periods. The surveys of the bankers, however, are not very helpful in determining the start of the reduced willingness to lend because they were discontinued from 1984 to 1989 Nonetheless, the net percentage of banks reporting tighter standards remained above zero well into 1991, suggesting that the "credit crunch" was not necessarily brief

[14]The level of debt relative to GDP should not be overemphasized Net worth, cash flow relative to interest expenses, and other factors are also important in determining the burden of debt A review of these issues can be found in Ben Bernanke and John Campbell, "Is There a Corporate Debt Crisis?" *Brookings Papers on Economic Activity*, 1988 1, pp 83-140 For an earlier review of the relationships among debt burdens, cash flows, and net worth in determining how financial factors can destabilize the economy, see Hyman Minsky, "Financial Crisis, Financial Systems, and the Performance of the U S Economy," *Private Capital Markets*, Commission on Money and Credit, 1964

Chart 4

Spread between Personal Loan Rate and the Six-Month Certificate of Deposit Rate

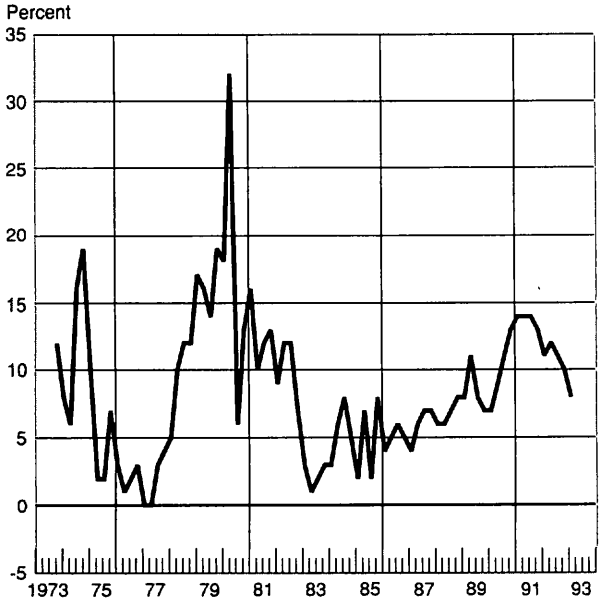


Source Board of Governors of the Federal Reserve System

Note Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

Chart 5

Borrower Surveys of Credit Availability: Net Percent Reporting "Loans Harder to Get" than in Previous Quarter



Source National Federation of Independent Businesses.

Some of the reasons that banks became more reluctant to lend were the increases in their charge-off rates and delinquency rates on all types of bank loans, including consumer loans, C&I loans, and real estate lending (Chart 10) These problem loans tended to weaken bank capital positions, and as Chart 11 indicates, lending tended to slow or decline more over time at those banks with lower capital positions.[15] Again, this evidence is consistent with supply side factors' playing at least some role in bank credit slowdown.[16]

[15]Note, however, that this chart should be interpreted with caution if the object is to analyze how serious the crunch might have been at capital-constrained banks First, some borrowers did have the ability to switch from weak banks to strong banks during this period, thereby inflating the strong-bank numbers and reducing the weak-bank numbers with no real change in aggregate lending Second, the relatively better performance of the strong banks stems "in part" or "to some extent" from the acquisition of weaker banks, again leading to an overstatement of the impact of their relative performance on aggregate credit availability Finally, the distribution of bank assets across capital classifications is not uniform Well-capitalized banks have just under 65 percent of all assets, adequately capitalized slightly more than 33 percent, and undercapitalized banks just under 2 percent

[16]There is also some evidence that banks tightened lending terms during the credit crunch period In 1985, 25 percent of short-term loans required collateral, in 1989, 41 percent For long-term lending, 47 percent were collateralized in 1985 and 65 percent in 1989

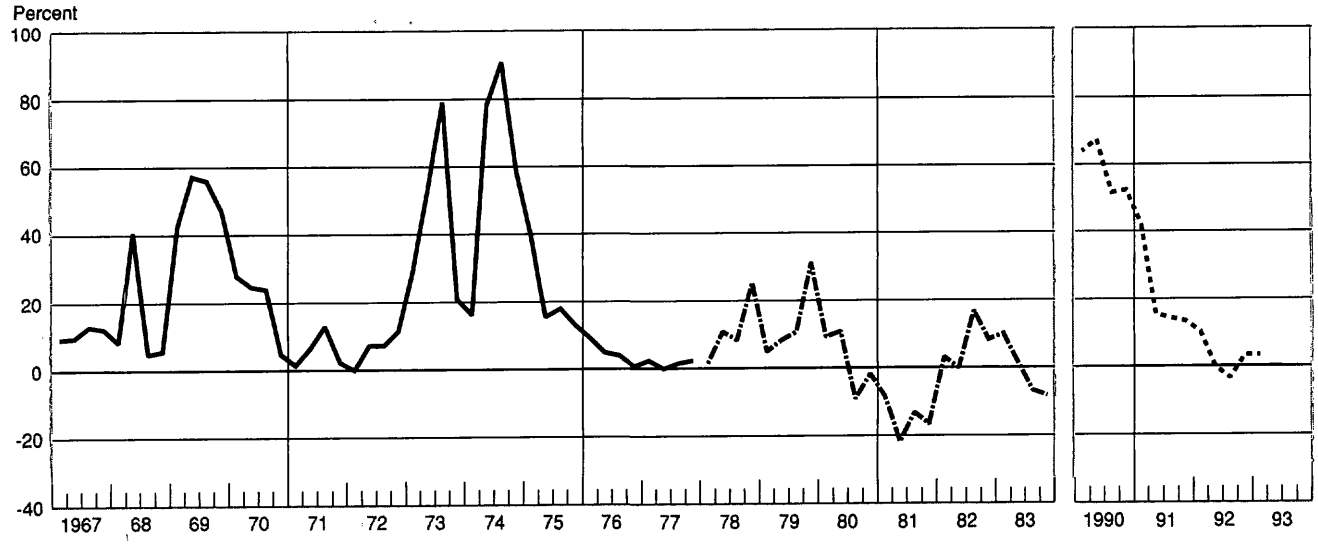
Finally, Chart 12 highlights another possible indicator of the increased reluctance of banks to lend during this period Banks sharply increased their holdings of securities as a share of C&I loans plus securities This increase, however, appears to be a fairly typical cyclical response, and whether it is ultimately indicative of a reduced willingness to lend from the supply side or a lack of demand for bank loans will depend on how long this trend persists in this most recent business cycle.[17]

In sum, there appear to be several indications that the slowdown in lending at banks was not just demand driven; factors from the supply side seem to have contributed as well. In all cases, however, the interpretation of the supply indicators is ambiguous to some degree, making it difficult to assess how much supply-side con-

[17]In Board of Governors of the Federal Reserve System, "Senior Loan Officer Opinion Survey on Bank Lending Practices," August 1992, bank loan officers were asked why their bank had increased its securities holdings over the last 2½ years Of the fifty-nine respondents, thirty-five emphasized that securities offered greater profits, thirteen cited the uncertain economic outlook, eleven said they were seeking to fund anticipated increases in loan demand, nine said they wished to improve their risk-based capital ratios, and nine gave other reasons (Banks were allowed more than one answer)

Chart 6

Lender Surveys of Credit Availability: Net Percent Reporting Firmer Standards than in Previous Quarter

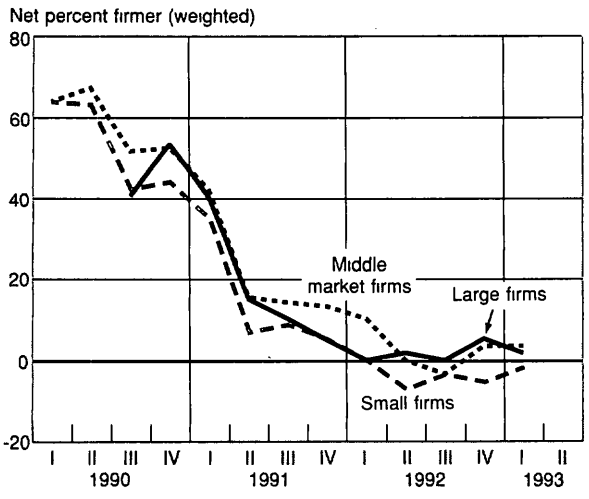


Notes. The Senior Loan Officer Survey questionnaire focused on different measures of creditworthiness over the years in 1967-77, credit standards for loans to nonfinancial businesses, in 1978-83, standards to qualify for the prime rate, in 1990-92, credit standards for loans to nonfinancial businesses by size of firm The values for 1990-92 in the chart reflect credit standards for approving loans to middle market firms

The Survey results are transformed into an index, "net percent firmer," by weighting individual response as follows considerably firmer (200%), moderately firmer (100%), unchanged (0%), moderately easier (-100%), and considerably easier (-200%)

Chart 7

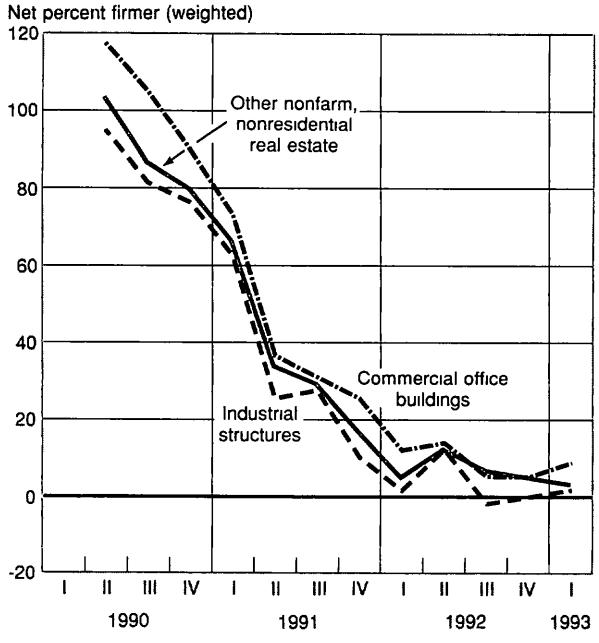
Standards of Creditworthiness for Commercial and Industrial Loans



Source Board of Governors of the Federal Reserve System, Senior Loan Officer Opinion Survey

Chart 8

Credit Standards for Real Estate Loans



Source Board of Governors of the Federal Reserve System, Senior Loan Officer Opinion Survey

siderations may have added to the overall slowdown in credit.

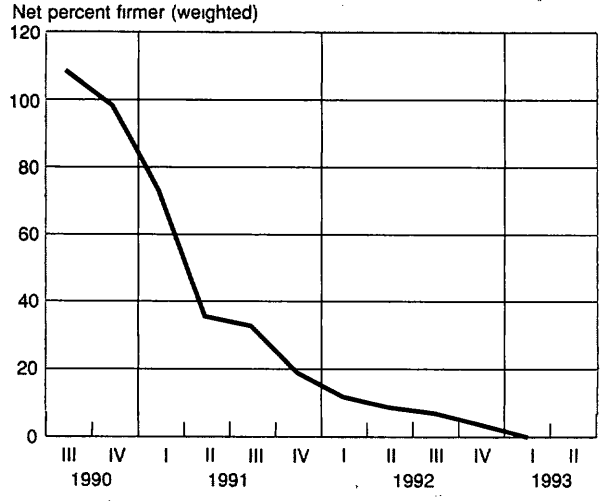
C. Nonbank intermediaries

Finance companies and insurance companies also faced difficulties during the 1989-91 period that may have curtailed their ability to extend credit As a result, credit supply problems may have been created for certain types of borrowers dependent on these intermediaries for credit. Many finance companies were downgraded by the credit rating agencies either because the financial condition of their parent companies had deteriorated or because they themselves had suffered major losses in their commercial lending businesses These credit rating downgrades may have had a significant effect on lending because most finance companies raise the majority of their funds in short-term public credit markets. (Chart 13 shows the large increase in loan loss reserves at finance companies, while Chart 14 contains a summary of the credit rating downgrades.) As a result of these difficulties as well as the general reduction in the demand for credit, finance company lending slowed considerably after 1989 after growing quite rapidly through much of the 1980s.

Similarly, in the life insurance industry, many firms experienced credit rating downgrades and intense scrutiny in the press and in Congress because of weak

Chart 9

Credit Standards for Land and Development Loans



Source Board of Governors of the Federal Reserve System, Senior Loan Officer Opinion Survey

earnings, poor asset quality, and the appearance of inadequate supervision and insufficient capital. Most of the industry's problems can be traced to problem commercial real estate loans (Chart 15), poorly performing junk bond portfolios, and the generous rates of return promised to investors in guaranteed investment contracts in the mid-1980s As a result of these problems and the failures of some insurance companies, the National Association of Insurance Commissioners (NAIC) adopted rules in mid-1990 that required greater disclosure of and reserves against below-investment-grade bonds. These developments not only reduced the willingness of insurance companies to invest in below-investment-grade bonds (Table 3),[18] but also contributed to a shift toward less risky private placement commitments more generally (Chart 16).[19] On the whole, for both insurance and finance companies, the evidence appears consistent with the notion that supply-side factors contributed to the slowdown in their lending, perhaps with stronger impacts on borrowers with weak credit ratings

[18]Table 3 reports the declining share of bonds rated "B or below" in insurance company investment portfolios The new NAIC rules reportedly had their greatest impact on the willingness of insurers to invest in BB-rated bonds, but time series data on this class of investments are not readily available

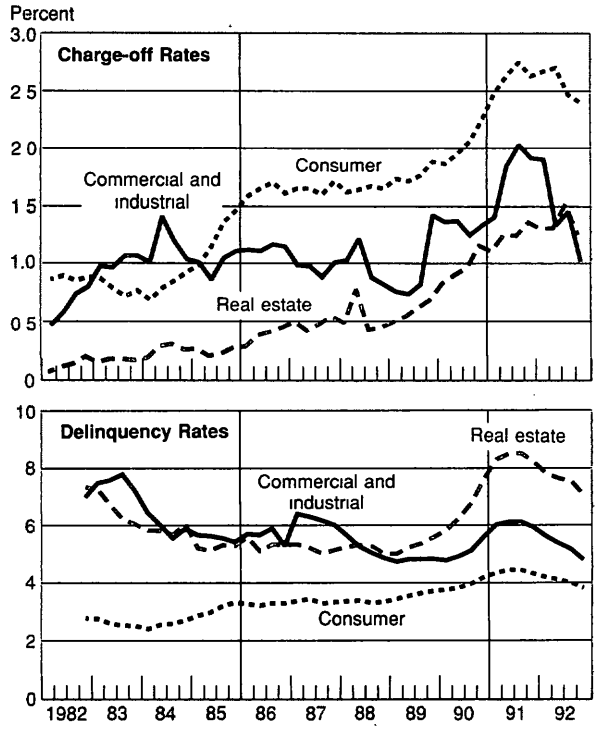
D. Bond and commercial paper markets

In the investment-grade corporate bond market, only very limited evidence of reduced credit availability can be found despite a huge surge in defaults (Chart 17) and a much wider spread between the number of downgraded corporations and the number of upgrades during this period (Chart 18). There was only a slight tendency for a wider spread to develop between corporate bond

[19]This subject is discussed further in Mark Carey, Stephen Prowse, John Rea, and Gregory Udell, "The Private Placement Market Intermediation, Life Insurance Companies, and a Credit Crunch," and Patrick Corcoran, "The Credit Slowdown of 1989-1991 The Role of Demand," in *Credit Markets in Transition*, Federal Reserve Bank of Chicago, 1992 Both papers report that spreads between public and private placements for bonds rated BB or below widened to unprecedented levels during the credit crunch period

Chart 10

Charge-off and Delinquency Rates on Loans by Medium and Large Insured Commercial Banks, by Type of Loan

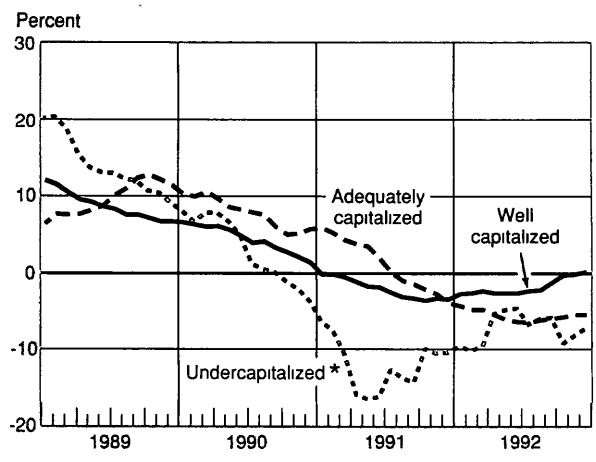


Source. Board of Governors of the Federal Reserve System, Senior Loan Officer Opinion Survey.

Chart 11

Loans at Weekly Reporting Banks Selected by Capital Status

Growth from Twelve Months Earlier



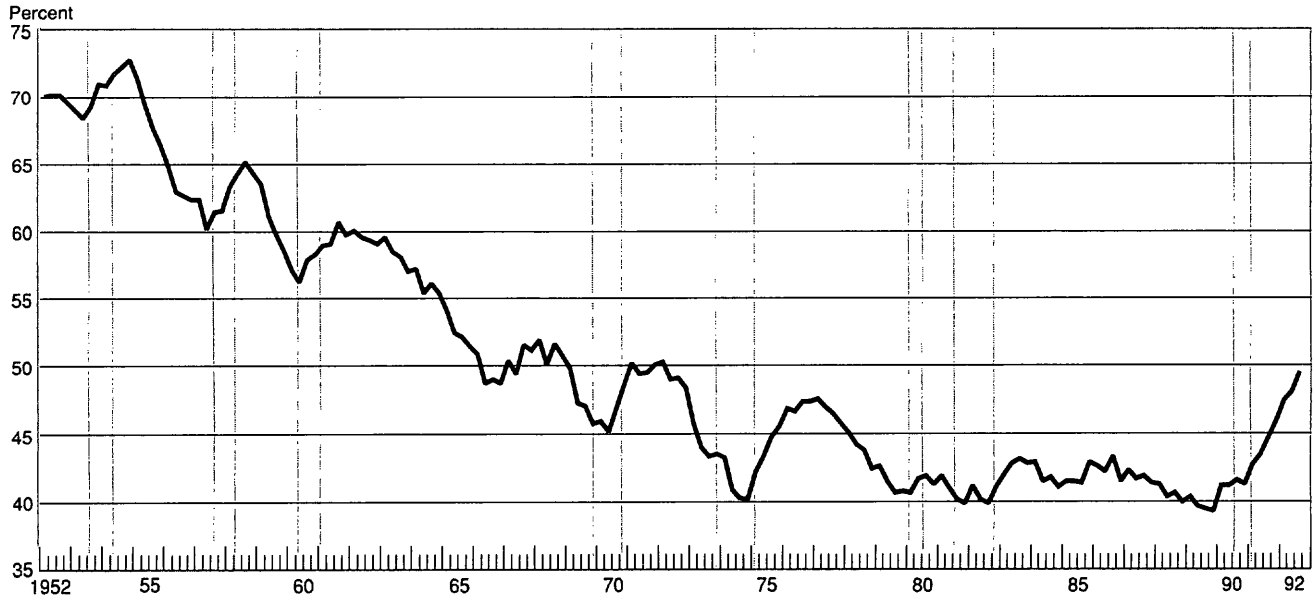
Source. Board of Governors of the Federal Reserve System.

Note· Capital status determinations, based on the Federal Deposit Insurance Corporation *Call Report*, are as of September 30, 1992

* Includes undercapitalized, significantly undercapitalized, and critically undercapitalized banks

Chart 12

Security Holdings of Banks as a Percentage of Security Holdings of Banks plus Commercial and Industrial Loans



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

Note Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

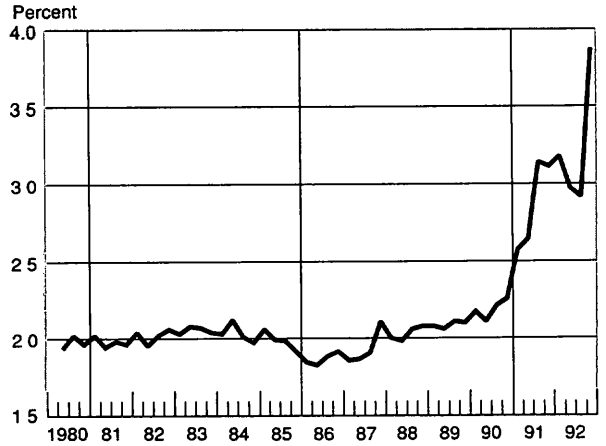
rates and the Treasury bond rate (Chart 19). Likewise, only a slightly wider spread became apparent between the Baa-rated issues and the Aaa-rated issues (Chart 20) These results suggest that investment-grade borrowers were not severely squeezed during this period.

The junk bond market was more severely affected than the investment-grade market. New issuance of publicly traded junk bonds virtually ceased by 1990 (Chart 21), and the yield spreads between junk bonds and investment-grade bonds soared in 1989 and 1990 (Chart 22), suggesting a "credit crunch" of sorts in the junk bond market. Likewise, privately placed below-investment-grade bonds were hard hit during this period. As noted earlier, insurance companies reduced their willingness to invest not only in publicly traded junk bonds, but also in below-investment-grade private placements, a traditional life insurance investment in middle market firms without public credit ratings. As a result, private placements declined sharply as a percentage of total bonds issued (Chart 23), although in part this development appears to be normal during recessions.

Chart 13

Loan Loss Reserves at Finance Companies

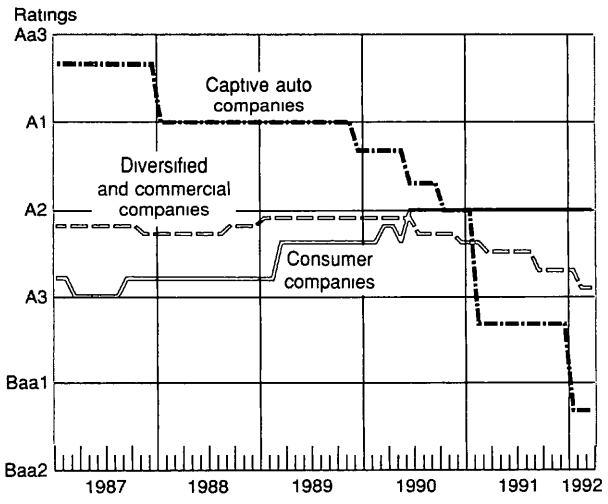
Percent of Net Receivables



Source. Board of Governors of the Federal Reserve System

Chart 14

Senior Debt Ratings of Finance Companies

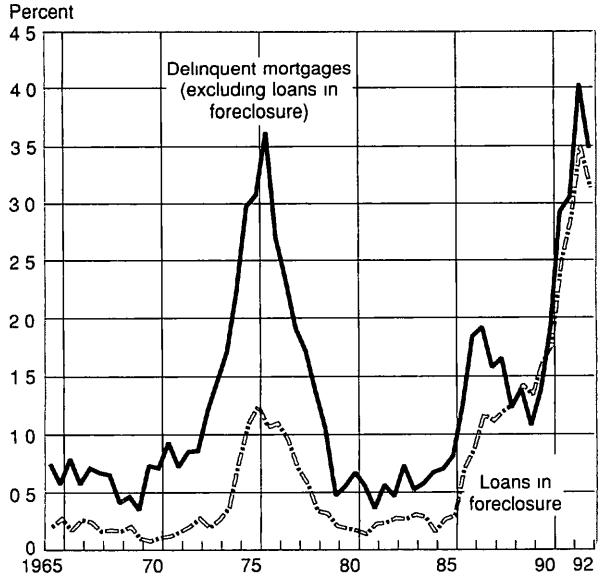


Source Moody's Investor Service

Note Sample consists of five consumer companies, three captive auto companies, and ten diversified and commercial companies

Chart 15

Problem Commercial Mortgages at Life Insurance Companies



Source American Council of Life Insurance

The commercial paper market also showed some signs of a "credit crunch" for borrowers without strong credit ratings Before 1989, only two defaults had occurred in the history of the U S commercial paper market, Penn Central in 1970 and Manville in 1982. In 1989, six issuers defaulted with $731 million in paper outstanding, and in 1990, six more defaulted with $391 million in paper outstanding Under these circumstances, the parents of commercial paper mutual funds purchased the defaulted paper at a loss to preserve the asset value of the money market mutual fund. The industry became concerned, however, that at some point a parent might not support a fund that had overinvested in risky commercial paper, possibly creating a run on the entire industry as investors attempted to exit before losses were realized In July of 1990, the Securities and Exchange Commission adopted rules that imposed strict limits on the amount of "second tier" paper that mutual funds could hold At least in part as a result, the share of second-tier commercial paper outstanding declined from about 15 1 percent in June 1990 to around 5.4 percent two years later[20] Since commercial paper is backed by bank lines, these firms probably had access to bank credit and may thereby have squeezed out other firms at capital-constrained banks

The spread between top-rated commercial paper and Treasury bill rates suggests that highly rated borrowers in 1990-91 had easier access to credit than in past

[20]This subject is discussed further in Leland Crabbe and Mitchell Post, "The Effect of SEC Amendments to Rule 2A-7 on the Commercial Paper Market," Working Paper no 199, Board of Governors of the Federal Reserve System, May 1992

Table 3

Bond Holdings Rated "B" or Below of Twenty Large U.S. Insurance Companies

Thousands of Dollars

Year	Total Bond Holdings (A)	Holdings Rated "B" or Below (B)	(B)/(A)
1987	$211,637	$17,545	8 3%
1988	255,089	17,810	7 0
1989	281,881	19,604	7 0
1990	303,548	17,504	5 8
1991	334,965	16,502	4 9

Sources Conning and Company, Federal Reserve Bank of New York estimates

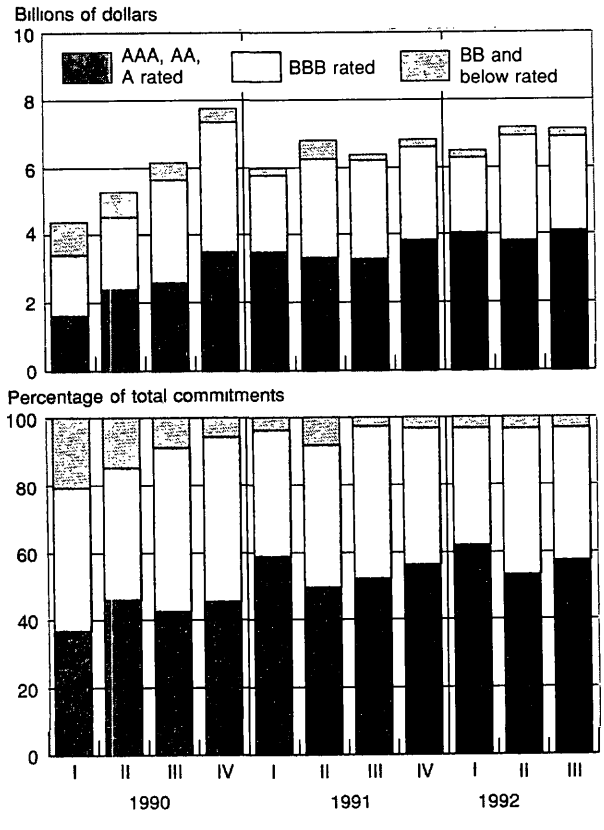
Notes Sample consists of the twenty life insurance companies with the highest corporate bond holdings It does not include companies with large holdings of low-rated bonds but relatively small total bond holdings, such as First Capital and Executive Life TIAA-CREF is excluded because data are unavailable

recessions (Chart 24). However, the spread between the rate on A-2/P-2 paper and the rate on A-1/P-1 paper was unusually wide in 1990 and 1991, with dramatic spikes at year-end as investors avoided lower grade paper and made last-minute adjustments to avoid reporting risky assets on their public accounting statements The longer term market, as noted earlier, was not as dramatically affected (Chart 25).

As in the case of the financial intermediaries, much of the evidence from the commercial paper market and the bond market appears consistent with the notion that supply-side factors contributed to the credit slowdown as investors shifted toward less risky assets. Although demand-side forces were probably important, the evidence in this section suggests that supply-side considerations resulting from weakened financial intermediaries and more conservative investment strategies played a strong role in the credit slowdown

Chart 16

Private Placement Fixed-Rate Bond Commitments by Life Insurers



Source American Council of Life Insurance

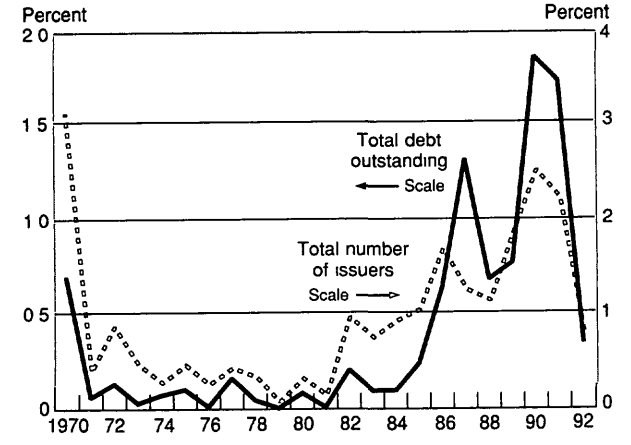
III. Other factors behind the credit slowdown

The credit slowdown that followed these events has been a protracted one, in part because the economy went through a period of slow growth and recession that lasted over three years. Consumers and businesses that had amassed heavy debt burdens in the 1980s were in no position to promote a rapid recovery by increasing spending, even if credit were readily available. Moreover, fiscal policy, encumbered by large deficits, could only play a very limited role in turning the economy around. Monetary policy, in contrast, eased throughout this period, reducing short-term rates substantially. Borrowers with direct access to the financial markets (those with investment-grade ratings) clearly benefited from this policy change, but those borrowers who relied on intermediated credit may not have benefited as much as they might otherwise have done if our financial intermediaries had been in strong financial condition. Banks, coping with their own problems, maintained very wide net interest rate margins even as monetary policy eased. Hence the difficulties experienced by the financial intermediaries in recent years may have reduced the effectiveness of monetary policy by blocking the "credit channel."[21]

[21]For more detail, see Donald Morgan, "Are Bank Loans a Force in Monetary Policy?" Federal Reserve Bank of Kansas City *Economic Review*, Q2-1992, pp 31-41 An earlier, more theoretical exposition can be found in Ben Bernanke and Alan Blinder, "Credit, Money and Aggregate Demand," *American Economic Review*, May 1988, pp 435-39 An account of the credit channel written for a more general audience can be found in Ben Bernanke, "Monetary Policy

Chart 17

Corporate Bond Defaults

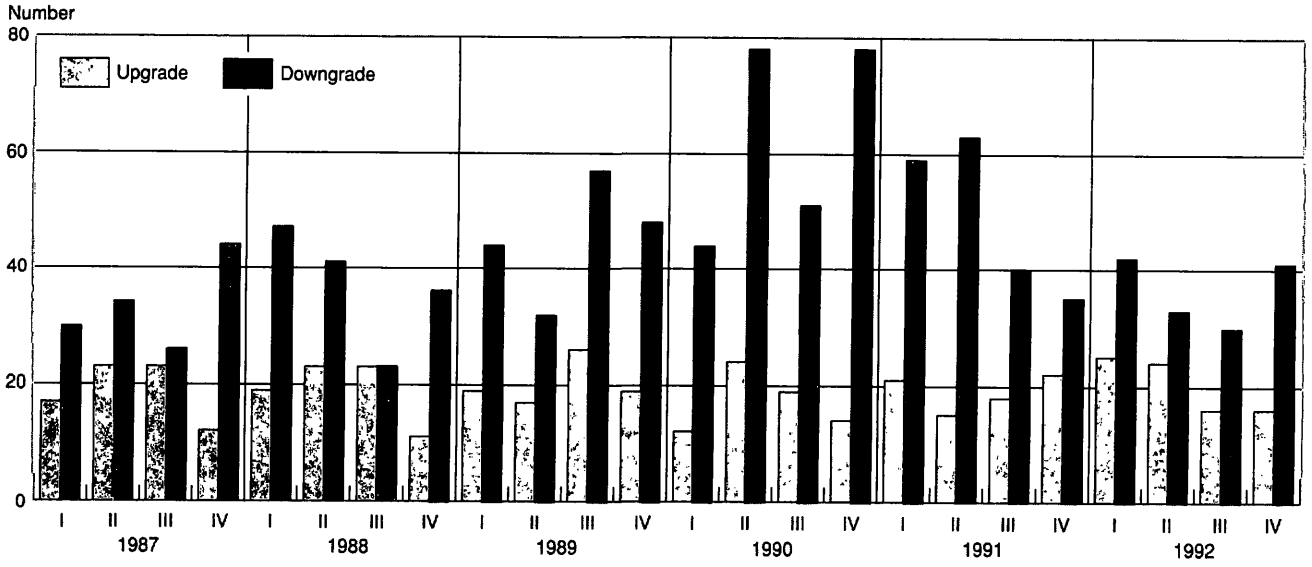


Sources: Morgan Stanley, Moody's Investor Service, Standard & Poor's Corporation

Chart 18

Credit Rating Changes for U.S. Corporate Bonds

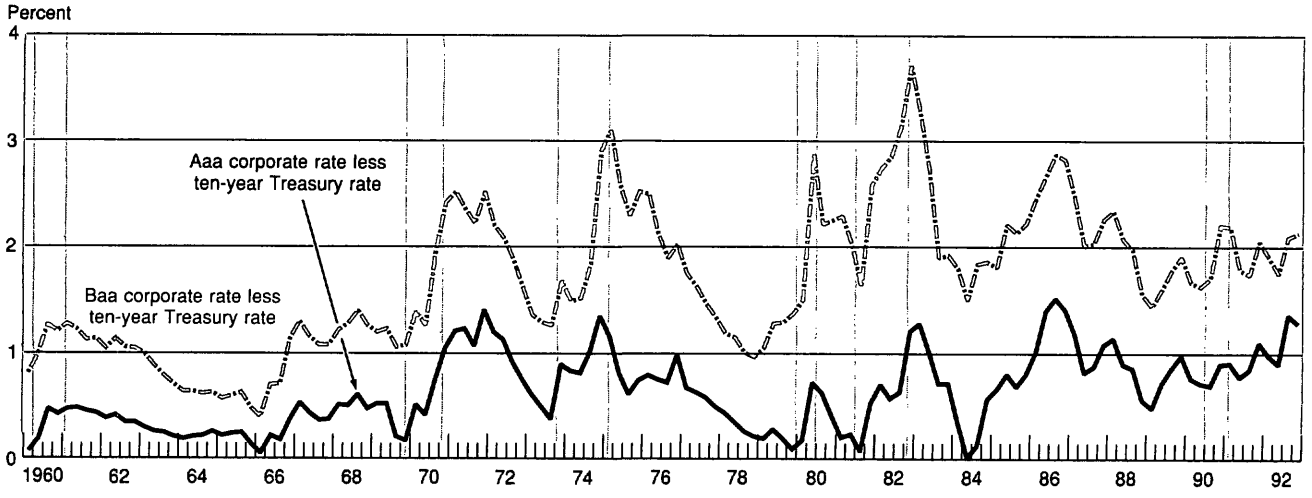
Industrial Corporations



Source. Moody's Investor Service

Chart 19

Investment Grade Corporate Bond Rates less Ten-Year Treasury Rate



Sources: Moody's Investor Service, Federal Reserve Bank of New York Market Reports

Note: Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

In sum, although there has been considerable time to analyze and debate the nature and causes of the "credit crunch," and although most analysts might agree in a broad sense with the outline presented above, a true consensus has not emerged even at this late date as to how much weight should be assigned to the various forces involved. Because a slowdown in economic activity lowered credit demand at the same time that (1) consumers and business worked to reduce heavy debt burdens, (2) financial intermediaries reevaluated their secured and unsecured lending standards in light of the fall in real estate values and the recession, and (3) the asset quality and capital adequacy of financial institutions came under increased scrutiny by private investors and regulators, it has been difficult to sort out the demand and supply causes of the recent credit slowdown.

While we can find evidence that supply-side factors contributed to the credit slowdown, the presence of some demand-side factors as well makes it difficult to estimate precisely how much of the slowdown should be attributed to supply-side considerations. The situation is made more complex because other factors, not associated with the excesses of the 1980s, may also have played a role. In the remainder of this section, we will briefly review two of these special factors that could have contributed to the slowdown in credit in the late 1980s: improved inventory management and the actions of the regulators.

A. Inventory management

Some analysts have noted that improved inventory management since the early 1980s, particularly in the manufacturing sector, may have reduced the demand for short-term financing in the most recent cycle [22] As a result, cyclical comparisons of C&I loans for evidence of a credit crunch may be biased because this change in inventory management may have created an exogenous decline in the demand for C&I lending.

Chart 26 shows a downward trend in the ratio of inventory to sales beginning in the early 1980s The shift is most dramatic for the manufacturing sector, where anecdotal evidence suggests increased use of

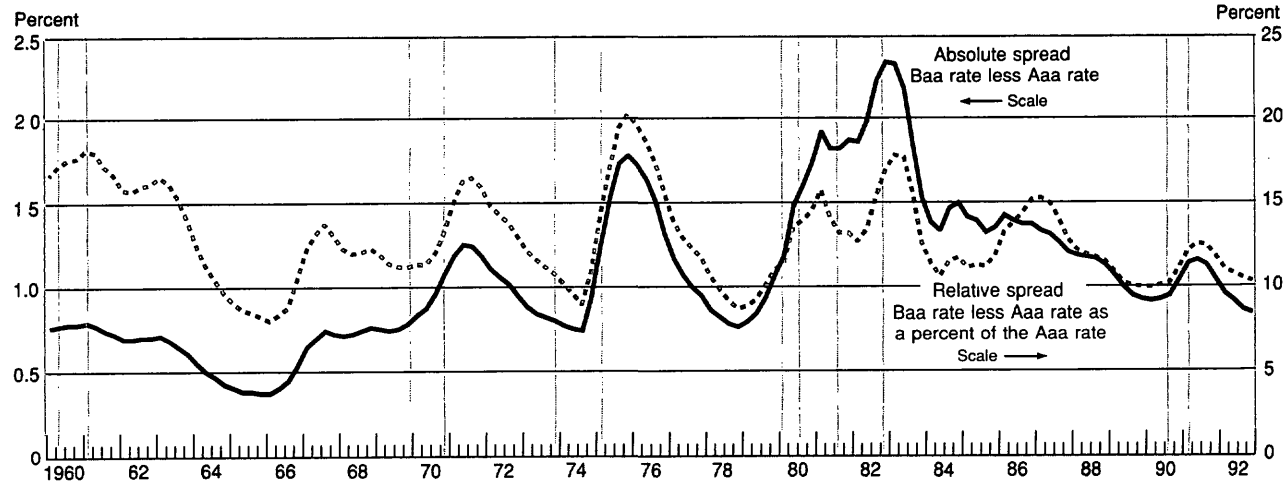
Footnote 21 continued
Transmission Mechanism Through Money or Credit?" Federal Reserve Bank of Philadelphia *Business Review*, November-December 1988, pp 3-11

[22]An analysis of the role of inventories in the recent credit slowdown can be found in Kevin Kliesen and John Tatom, "The Recent Credit Crunch The Neglected Dimension," Federal Reserve Bank of St Louis *Review*, September-October 1992, pp 18-36 For documentation of improved inventory management, see Dan Bechter and Stephen Stanley, "Evidence of Improved Inventory Control," Federal Reserve Bank of Richmond *Economic Review*, January-February 1992, pp 3-12

Chart 20

Investment Grade Corporate Bond Spreads

Four-Quarter Moving Average



Source Moody's Investor Service, Federal Reserve Bank of New York Market Reports

Note: Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

"just-in-time" inventory management. Chart 27 indicates that a loose relationship has existed between the growth in nominal inventories and bank C&I loans over time, including the period since 1989 during which both series have slowed dramatically.

In Chart 28, we compare the ratio of business inventories to sales for the most recent cycle with the corresponding ratio for an average of four earlier cycles.[23] Over the most recent cycle, this ratio has ended up roughly 7 percentage points below the normal pattern, the level of nominal inventories is roughly $75 billion less than would be expected on the basis of past cycles.

It is more difficult to judge how weak business loans are relative to a "normal cyclical pattern." Chart 29 compares C&I loans in the most recent cycle with the average of past cycles. It suggests that C&I lending is roughly 37 percentage points weaker, a shortfall that amounts to about $288 billion. Given that $75 billion (the unusual weakness in inventories) is about 25 percent of $288 billion, it appears that better inventory management did have some impact on C&I lending, although this improvement explains only a relatively small fraction of the overall weakness.

Alternatively, in Chart 30 we compare the ratio of C&I lending to business sales in the most recent cycle and in earlier cycles. Relative to the level of business activity, lending appears to be about 24 percentage points, or $187 billion, weaker in the most recent cycle This cyclical comparison suggests that the $75 billion shortfall in inventories would amount to about 39 percent of the unusual weakness in C&I lending. These orders of magnitude, 25 to 39 percent, are intended to be only rough estimates of the possible role of inventories from the demand side and could overstate the impact of the demand side to the extent that banks systematically cut back on business lending during the crunch period, including lending to finance inventories. In addition, not all inventories are financed at banks. some are financed in the commercial paper market or at finance companies [24] In any case, while improved inventory management may be part of the story behind the slowdown in bank lending, its contribution is relatively small

B The regulators

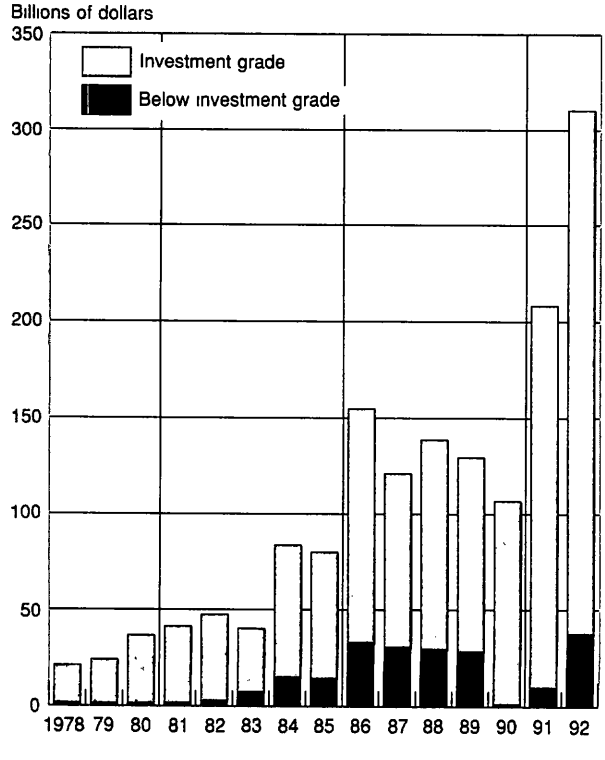
Because several factors from both the demand side and the supply side have apparently contributed to the slowdown in credit, the role of regulators in this credit slowdown is difficult to determine empirically, although the regulators certainly have received more attention in the press. To the extent that the regulators forced banks to face up to the reality of the real estate market and the state of the economy, they were merely messengers bearing bad news That is, since the effects of some other factors contributing to the credit slowdown were transmitted through the regulatory process, the exogenous role of the regulators may have seemed larger than it actually was. Nevertheless, to the extent that regulators became more aggressive in pressing banks to raise credit standards, they could have been an independent factor behind the slowdown in bank lending

Governor LaWare, in a recent statement before Congress, provided a summary of the regulatory process

[23]By indexing each cycle relative to the peak quarter, we can largely eliminate the longer run downward trend in inventories and focus more directly on how businesses have managed inventories in this most recent cycle relative to earlier cycles and hence may have made business loans appear unusually weak in this most recent cycle

Chart 21

Nonconvertible Public Domestic Debt Issuance

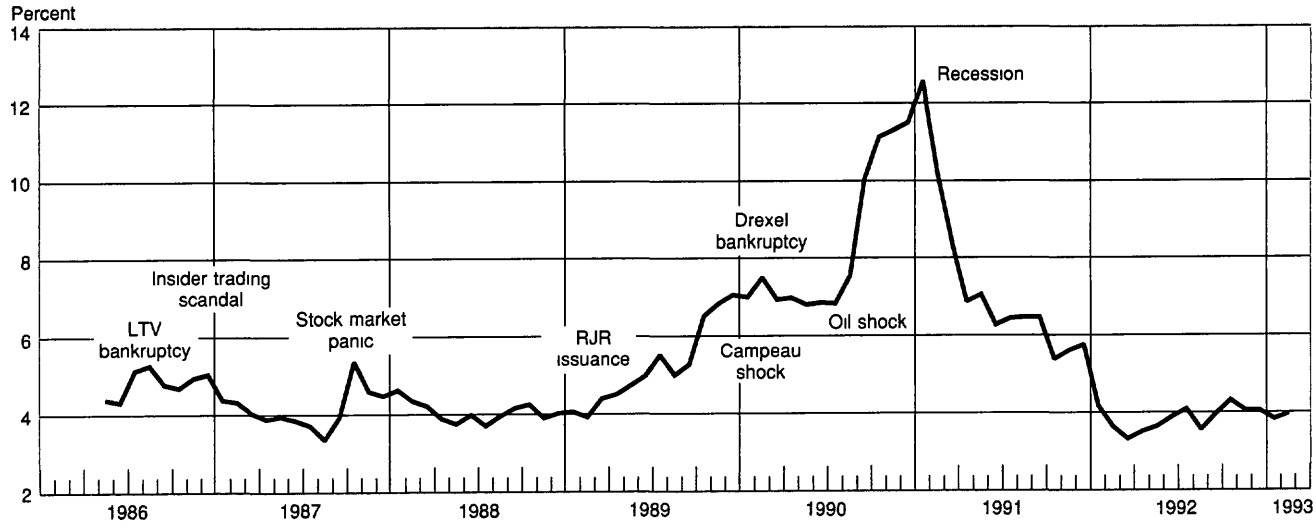


Sources Morgan Stanley, *Investment Dealers' Digest*; Securities Data Corporation.

[24]If we repeat the above exercise but include business lending at finance companies and nonfinancial commercial paper along with C&I lending at banks, inventories can account for 15 to 29 percent of the cyclically unusual weakness in total short-term business credit

Chart 22

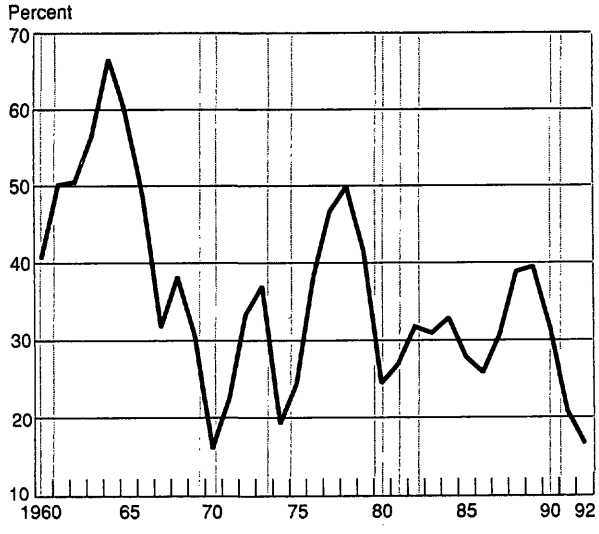
High-Yield Corporate Bond Rate less Ten-Year Treasury Rate



Source Morgan Stanley

Chart 23

Share of Total Private Placements in Corporate Bond Issuance



Source *Federal Reserve Bulletin*

Note Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

during this period He noted that with the benefit of hindsight, we can see that regulators should probably have acted much earlier and more vigorously in the boom phase to avert the banking industry's problems, but that it is difficult to impose such standards in good times. Governor LaWare also addressed the question of allegedly excessive tightening of credit standards and the regulatory agencies' responses.[25]

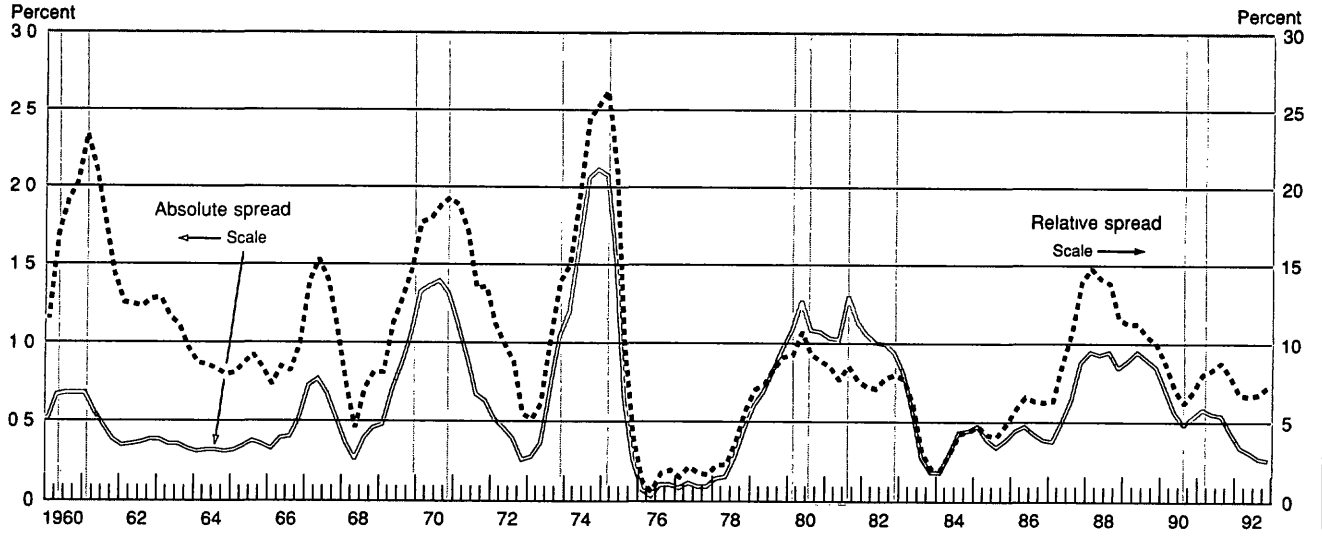
> Concerns about excessive tightening of credit standards by many banks and the inability of apparently creditworthy borrowers to obtain or renew bank financing in the wake of examiner criticisms of commercial real estate credits led the agencies to undertake an extensive review of their examination practices throughout much of last year. In recognition that banks had shifted markedly in their willingness to lend, the agencies undertook special efforts to coordinate and clarify their supervisory policies.
>
> Much of the reduced willingness to lend was understandable given weak economic conditions, the level of excess capacity in commercial real estate

[25]John LaWare, testimony before the House Committee on Banking, Finance, and Urban Affairs, July 30, 1992

Chart 24

Six-Month Commercial Paper Rate less Six-Month Treasury Bill Rate

Four-Quarter Moving Average

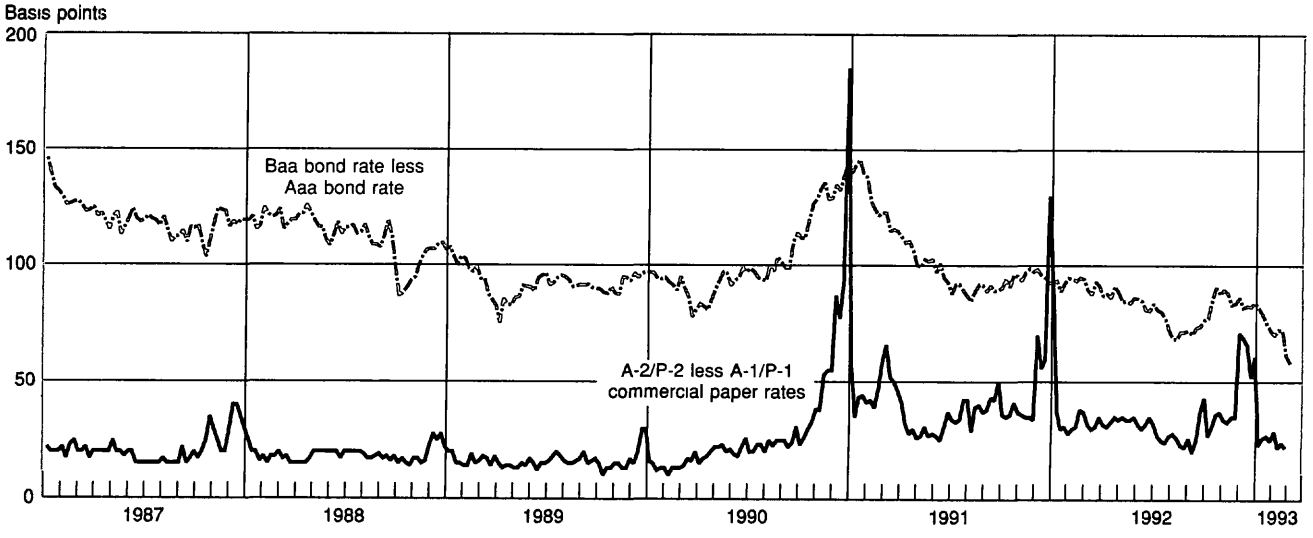


Source. Federal Reserve Bank of New York Market Reports.

Notes. Relative spread is the commercial paper rate less the Treasury bill rate as a percentage of the Treasury bill rate. Absolute spread is the commercial paper rate less the Treasury bill rate Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

Chart 25

Quality Spreads in the Commercial Paper and Corporate Bond Markets



Sources: Moody's Investor Service; Federal Reserve Bank of New York Market Reports.

markets, and the asset quality problems of many banks. Moreover, some strengthening of credit standards was needed in much of the industry, and those changes would necessarily affect the lending policies of many banks. Nevertheless, the agencies felt that banks might be tightening unduly because of concerns about supervisory actions. We wanted to ensure that banks did not misunderstand our supervisory policies or believe that examiners would automatically criticize all new loans to troubled industries or borrowers.

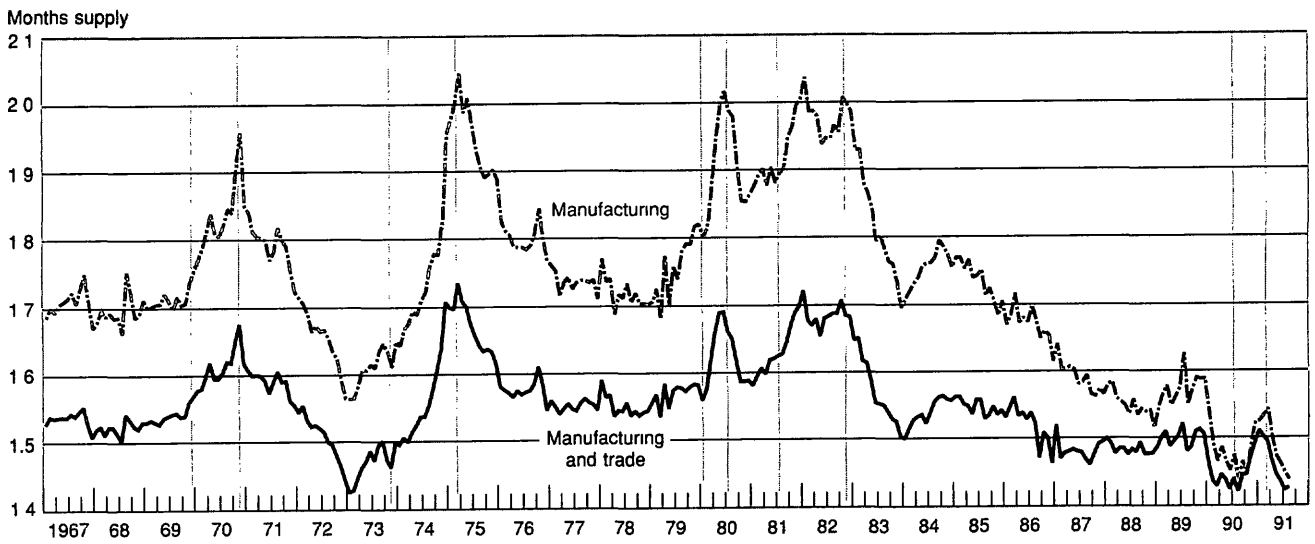
Accordingly, building on earlier initiatives, in March 1991, the agencies issued a joint statement to address this matter. That statement sought to encourage banks to lend to sound borrowers and to work constructively with borrowers experiencing temporary financial difficulties, provided they did so in a manner consistent with safe and sound banking practices. The statement also indicated that failing to loan to sound borrowers can frustrate bank efforts to improve the quality and diversity of their loan portfolios. Under-capitalized institutions and those with real estate or other asset concentrations were expected to submit plans to improve their positions, but they could continue sound lending activities provided the lending was consistent with programs that addressed their underlying problems.

At other times during the year, and particularly in early November, the agencies expanded on that March statement and issued further guidance regarding the review and classification of commercial real estate loans. The intent was to ensure that examiners reviewed loans in a consistent, prudent, and balanced fashion. This second statement emphasized that evaluation of real estate loans should be based not only on the liquidation value of collateral, but also on a review of the borrower's willingness and ability to repay and on the income-producing capacity of the properties

Finally, in December, in order to assure that these policies were properly understood by examiners and to promote uniformity, the agencies held a joint meeting in Baltimore of senior examiners from throughout the country in one more effort to achieve the objectives just described. Once again, the principal message was to convey the impor-

Chart 26

Ratio of Real Inventories to Real Sales



Source U S Department of Commerce

Notes Values are based on data available as of December 1, 1992 Shaded areas indicate periods designated recessions by the National Bureau of Economic Research

tance of balance Examiners were not to overlook problems, but neither were they to assume that weak or illiquid markets would remain that way indefinitely when they evaluated commercial real estate credits.

Because the regulators were part of the process through which the banks became aware of the changing economic situation, precisely defining their role is difficult. Indeed, other regulators have suggested more strongly than Governor LaWare that the shortcomings of the regulatory process were not in managing the retrenchment over the 1989-91 period, but rather in failing to contain the excesses created in the preceding three or four years.[26] They argue that the regulators should have been more aggressive in increasing capital earlier in the 1980s when the risky lending was actually taking place; this larger capital cushion could have been used to absorb loan losses during the downturn, preventing banks from having to cut off credit to other borrowers.

By imposing higher leverage capital ratios after the losses became apparent, the regulators, according to Syron and Randall, may have forced banks to downsize, thereby reducing credit supply to borrowers dependent on intermediated credit Thus, some banks that were able to meet the risk-based asset requirements found that their condition deteriorated. They were constrained by the higher leverage ratio of tier one capital to unweighted assets imposed by regulators. Clearly, investments could not be reallocated to meet this constraint, and the only option available to banks in this position was to downsize (if unable to raise more tier one capital) Chairman Greenspan and Richard Syron have argued that the leverage ratio should be eliminated as soon as the risk-based measures have been revised to capture the full spectrum of risks faced by bankers.[27]

[26]Richard Syron, "Are We Experiencing a Credit Crunch?" Federal Reserve Bank of Boston *New England Economic Review*, July-August 1991, pp 3-10, and Richard Syron and Richard Randall, "The Procyclical Application of Bank Capital Requirements," Federal Reserve Bank of Boston, *Annual Report, 1991*

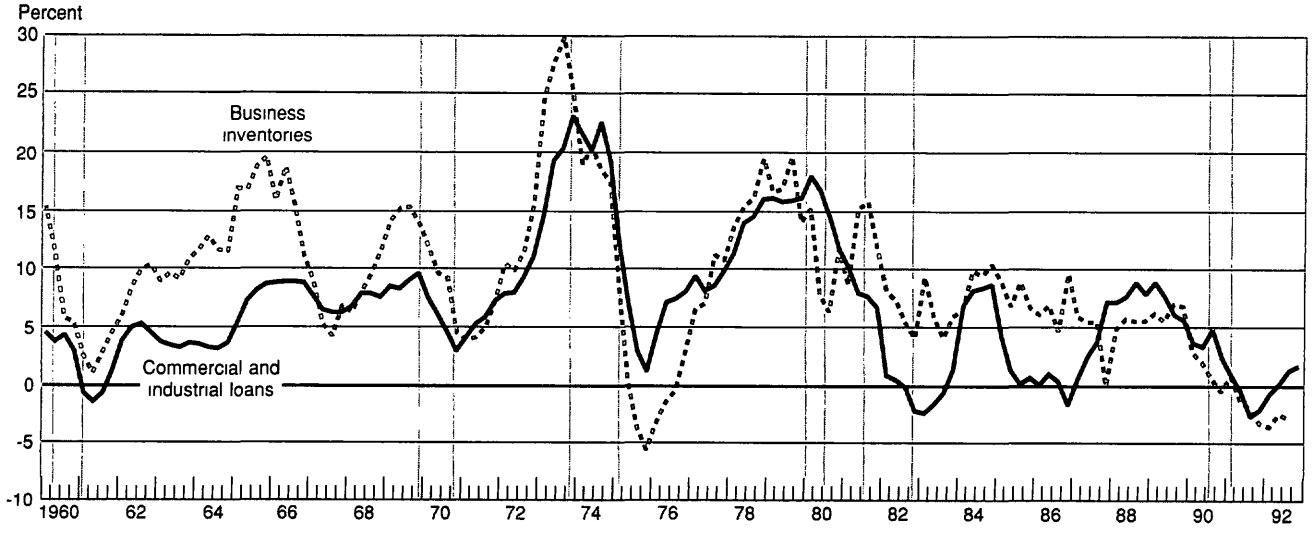
[27]For example, see the transcript of Chairman Greenspan's statement to the House Subcommittee on Domestic Monetary Policy, *Federal Reserve Report to Congress on Monetary Policy*, July 22, 1991, pp 35-36 Also see statements by John LaFalce, William Taylor, Jerome Powell, and Timothy Ryan, *The Impact of Bank Capital Standards on Credit Availability*, House Committee on Small Business, July 9, 1992

For additional views of the regulators on the credit crunch, see statements by Alan Greenspan, Paul Fretts, Robert Clark, and

Chart 27

Business Inventories and Commercial and Industrial Loans

Growth from Four Quarters Earlier



Source U S Department of Commerce.

Note· Shaded areas indicate periods designated recessions by the National Bureau of Economic Research.

In any case, by the late 1980s and early 1990s, steps were being taken to promote an alternative regulatory approach for banks after the costly savings and loan bailout. Higher capital requirements and insurance premiums were imposed, restrictions on access to the discount window were established for troubled institutions, and prompt regulatory intervention for weak institutions was encouraged by Congress and the regulators.[28] Chairman Greenspan, in a review of banking during the credit slowdown period, emphasized the need for reasonable balance in bank supervision in the future:

> On the bank supervisory front, we are going to have to find a reasonable balance between discouraging excessively risky loans and allowing some leeway for taking legitimate chances on lending opportunities. After we find this balance we are going to need to maintain it over the business cycle, an even more difficult task. We need to make certain that our examination standards remain cautious when loan demand is expanding at a speculative rate and do not become overly conservative at the other end of the cycle. This is not an easy activity. When a society is propelling asset values higher, it is very difficult to argue with bank management that the loans they are making may not be very well covered by collateral. And when collateral prices may be falling owing to forced liquidations of property, supervisors must keep their eyes on longer-term underlying values.[29]

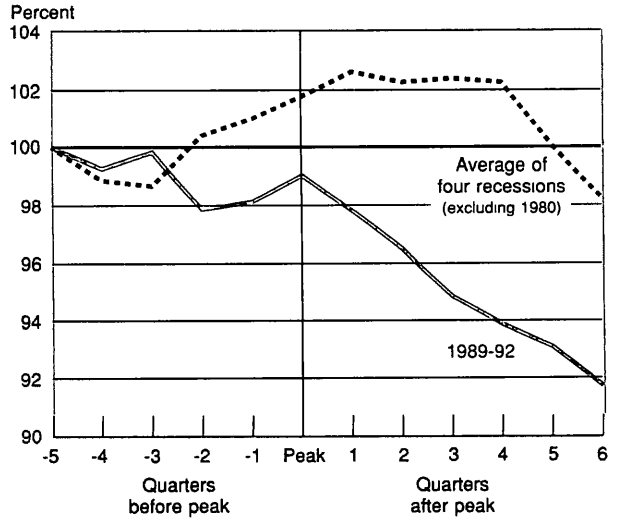
Outside the banking system, the rating agencies, insurance commissioners, and the Securities and Exchange Commission also reacted to the changing economic climate. The junk bond market collapsed in late 1989 and Drexel failed a few months later. Some insurance companies also failed and some financial firms defaulted in the commercial paper market. In response, several large insurance companies and finance companies were downgraded by the rating agencies, and insurance regulators required greater

Footnote 27 continued
Timothy Ryan in *Credit Availability*, Senate Committee on Banking, Housing, and Urban Affairs, June 21, 1990

[28]Many of these changes were required by the *Federal Deposit Insurance Corporation Improvement Act of 1991*, enacted December 19, 1991

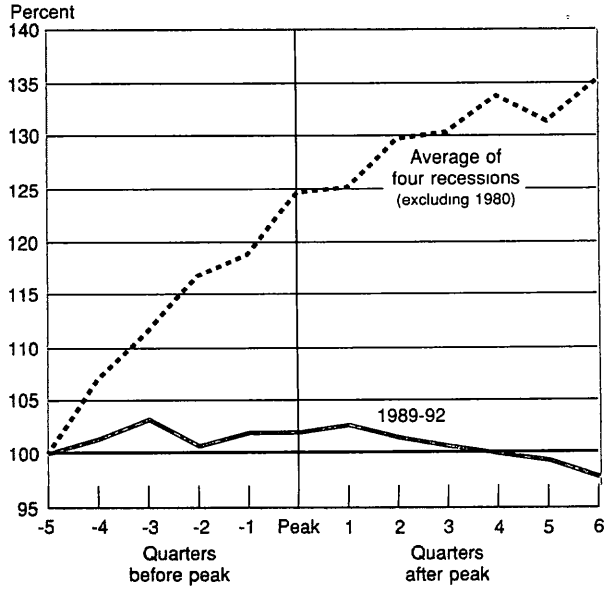
[29]Alan Greenspan, remarks before the Tax Foundation of New York, November 18, 1992, p. 7

Chart 28
Ratio of Inventories to Final Sales
Index = 100 Five Quarters before Peak



Source: U.S. Department of Commerce.

Chart 29
Commercial and Industrial Loans
Index = 100 Five Quarters before Peak



Source: U.S. Department of Commerce

disclosure of junk bond investments and raised related reserve requirements. As noted earlier, mutual funds were restricted in the amount of lower grade commercial paper they could hold. As a result, below-investment-grade borrowers in many cases were shut out of the long- and short-term money markets and had to seek funding from banks. The banks in turn were already downsizing, in some cases because of their own problems.

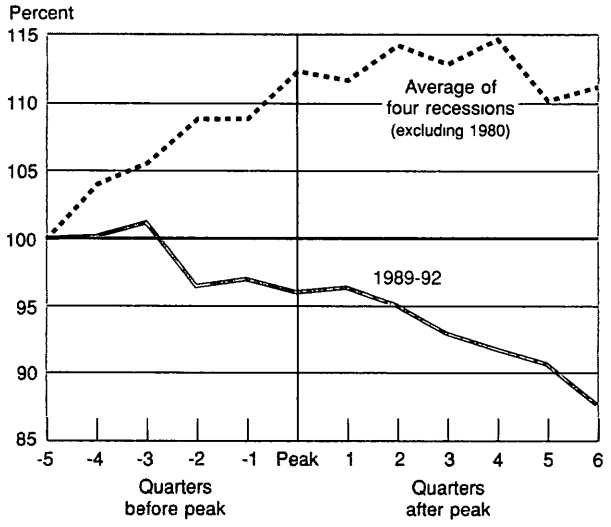
IV. Earlier credit crunches and credit cycle literature

This section reviews earlier postwar credit crunches and draws comparisons with the current episode. As the innovation and deregulation in recent years would lead one to expect, the most recent credit slowdown shows some distinctive features This section also examines the literature on the general process of credit cycles—in particular, the writings of Fisher, Minsky, and others—and asks whether this most recent credit slowdown can be explained within a theoretical framework that does not rely on institutional rigidities such as Regulation Q ceilings to create "credit crunches." We conclude that although the particulars differ, the important stylized features of the current credit cycle can be explained by these authors' models. Our findings add considerable empirical validation to their theories, especially as the theories apply to a deregulated financial system. In particular, our results bear out the hypothesis that deregulation of financial intermediaries will *not* necessarily produce a more stable financial system free of periodic credit crunches.[30] At the end of this section, we present a composite, highly stylized model (based largely on this earlier work) of how the credit cycle can lead to credit crunches.

Chart 30

Ratio of Commercial and Industrial Loans to Final Sales of Business

Index = 100 Five Quarters before Peak



Source: U S. Department of Commerce

A Comparison with earlier credit crunches

Earlier postwar credit crunch periods have been carefully described in previous studies.[31] Here we review them briefly before we identify the features that set the most recent episode apart from its predecessors. Table 4 provides a summary of earlier postwar credit crunch periods

In the years just after the Second World War, the banking system was both highly regulated and liquid in the sense that it held a large volume of government securities. Market interest rates also tended to be quite stable. Gradually, as market rates became less stable, banks began to use the liquidity in their portfolios of government securities to make private business loans. As a result, the banking system began a large-scale reduction in their holdings of government securities. Periods of credit stringency occurred near cyclical peaks during the 1950s, resulting in some disintermediation, but without the actual or prospective failure of any major players

Financial innovation was limited during the 1950s, although the banks did develop the federal funds market to buy and sell excess reserve balances. In researching the implications of the developing federal funds market, Minsky pointed out the likely implications of future innovations·

> As evolutionary changes in financial institutions and usages are the result of profit-seeking activities, the expectation is that such financial changes

[30]A similar conclusion was reached by Henry Kaufman in his October 9, 1991, *Wall Street Journal* article, "Credit Crunches The Deregulators Were Wrong "

[31]For more detailed descriptions, see Wojnilower, "The Central Role of Credit Crunches in Recent Financial History", Albert Wojnilower, "Private Credit Demand, Supply, and Crunches—How Different Are the 1980s?" *American Economic Review*, May 1985, pp 351-56, Hyman P Minsky, *Stabilizing an Unstable Economy* (New Haven Yale University Press, 1986), and Martin Wolfson, *Financial Crises* (New York M E Sharpe, 1986), pp 43-124

will occur most frequently during periods of high or rising interest rates. Such rates are evidence of a vigorous demand for financing relative to the available supply. They act as a signal to money-market professionals to seek ways of using the available lending ability more efficiently

Table 4

Summary of Recent Credit Crunches

Credit Crunch Years	Rising Interest Rates?	Disinflation?	Other Shocks	Recession?	Federal Reserve Easing?	Other Policy Responses	Regulatory and Market Reforms
1966	Yes	Yes	Federal Reserve sent a letter to member banks discouraging excessive lending President and Congress also called for credit restraint	"Mini"	Yes	Regulation Q ceilings on savings accounts were held in place while ceilings on large time deposits were raised substantially Discount window access eased	Corporate borrowers demanded formal credit lines Banks gained access to Euromarket liquidity
1969	Yes	Yes	President and Congress called for credit restraint Political constraints prevented banks from raising prime rate to clear the market Penn Central default, run on commercial paper market	Yes	Yes	Regulation Q ceilings on savings accounts were increased slightly, while ceilings on large time deposits were raised substantially Discount window access eased	Switch to policy based on monetary aggregates Elimination of Regulation Q for large time deposits
1974	Yes	Yes	Oil shock, New York City budget crisis Commercial real estate market collapse Failures of Franklin National Bank and Herstatt Prime rate held below federal funds rate	Yes	Yes	Regulation Q ceilings suspended in 1973	
1980	Yes	Yes	Change in Fed operating procedures Oil shock, Carter credit controls	Yes	Yes	Credit controls lifted	Legislation phasing out Regulation Q ceilings
1982	Yes	Yes	Failures of Drysdale, Penn Square, and Continental Illinois LDC debt crisis	Yes	Yes	Regulatory forbearance on LDC debt	More stringent bank capital requirements Change in monetary policy operating procedures Acceleration of Regulation Q phaseout
1990	Rates peaked early in 1989	Banks and thrifts lost deposits but did not bid aggressively to keep them	The thrift problem and the passage of the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) in late 1989 Collapse of markets for commercial real estate and junk bonds Bank capital crunch	Yes	Yes	Banks encouraged to lend by regulators and politicians Examination standards regarding commercial real estate lending were clarified Reserve requirements reduced	Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) further tightened regulatory oversight of depository institutions

> Essentially, the relations upon which the monetary authorities base their operations are predicated upon the assumption that a given set of institutions and usages exists. If the operations of the authorities have side effects in that they induce changes in financial institutions and usages, then the relations "shift." As a result, the effects of money operations can be quite different from those desired. To the extent that institutional evolution is induced by high or rising interest rates, this would be particularly significant when the central bank is enforcing monetary constraint in an effort to halt inflationary pressures.[32]

In the 1960s, as a result of the forces described by Minsky, financial innovation became a more important theme in the financial markets. Banks began "buying money" with large certificates of deposit (CDs) and started to manage their liquidity on the liability side rather than just on the asset side or at the discount window. For a period of time, the ceiling rates on these large CDs were raised by the Federal Reserve as market rates rose, and large CDs remained a flexible liability management tool for banks. In 1966, the Federal Reserve did not raise the ceiling rate on CDs in response to accelerating inflation, and a "credit crunch"—the term coined by Sidney Homer and Henry Kaufman to describe this event—took place.[33] Disintermediation occurred, banks stopped lending, and the Federal Reserve issued a letter stating that banks could use the discount window as a source of liquidity provided that (1) the funds were not used to expand lending and (2) banks reduced their selling of municipal securities, a practice that was contributing to disorderly conditions in that market.

Following this episode, banks discovered a new liability management instrument—the Eurodollar market. Their foreign branches would acquire funds in this market and relend the funds to their domestic parents. At the same time, many banking organizations adopted the form of the bank holding company, a change that allowed them to raise funds in the commercial paper market.

The next credit crunch stemmed more from a loss of confidence than from tight monetary policy directly, although monetary policy, as in 1966, had been tightening to control inflationary pressures in 1969. The failure of Penn Central in 1970 made it difficult for many companies to roll over commercial paper. Many companies turned to their commercial banks under these circumstances to honor their loan commitments, and the Federal Reserve made it known that the banking system's less liquid assets would be made liquid at the discount window if necessary to satisfy this sudden increase in loan demand. The Federal Reserve also suspended the ceiling rate on large CDs to make this funding source available to banks during this tense period.[34]

In the 1973-74 period, monetary policy was again tightening in response to an acceleration in inflation. As in 1969-70, the failure of a major institution played a role; this time, however, the CD market, not the commercial paper market, would be affected. Initially, however, it did look as though a commercial paper crisis was brewing. Many real estate investment trusts came close to bankruptcy as a result of rising short-term rates and were unable to continue funding themselves in the commercial paper market. As a result, they were forced to rely heavily on their banks, and another "Penn Central crisis" was feared. The large banks, however, were able to make these loans and averted a crisis in the commercial paper market. In early May of 1974, Franklin National's problem became known, and in June of that year Herstatt Bank (a German bank) failed and defaulted on its foreign exchange contracts. As a result, many banks were being carefully evaluated by investors, and tiering developed in both the CD market and the Eurodollar market. To avoid a crisis in the domestic and international money markets, the Federal Reserve made a large discount window loan to Franklin and encouraged other banks to lend to Franklin. Again in this cycle, housing and the thrift industries ended up bearing most of the pain from the rise in short-term rates, and a financial panic was avoided.

In 1979-80, monetary policy again tightened in response to increasing inflation, but this time the shock was not the failure of a major player, but rather credit controls imposed by the Carter administration. This credit slowdown seemed almost irrational in the sense that banks reduced their willingness to lend and consumers curtailed their use of credit and cut spending to a much greater extent than the credit controls demanded. Thrift institutions were protected somewhat from disintermediation by six-month certificates with floating rate ceilings, but their cost of funds increased sharply relative to the returns on their mortgage assets, generating large operating losses.

The 1981-82 recession followed a period of high and volatile interest rates. Once the recession began, the

[32]Hyman Minsky, "Central Banking and Money Market Changes," *Quarterly Journal of Economics*, May 1957, p 172

[33]Sidney Homer, "Does '66 Add Up to a Credit Squeeze or a Credit Crunch?" *The Commercial and Financial Chronicle*, September 29, 1966

[34]A detailed analysis of this episode can be found in Thomas Timlen, "Commercial Paper—Penn Central and Others," in Edward Altman and Arnold Sametz, eds., *Financial Crises* (New York: John Wiley and Sons, 1977)

financial markets became nervous after the failures of Drysdale and Penn Square and the threatened default by Mexico on $80 billion of bank loans. Investors became very cautious and attempted to substitute Treasury securities for the CDs of the exposed banks. Eventually Mexico's debts were refinanced, as were the debts of Argentina and Brazil. Although housing and the thrift industry were strongly affected during the 1979-82 period, a process of deregulation was occurring that would tend by the late 1980s to insulate housing somewhat from future tightening in monetary policy, at least in the sense that credit flows would not be disrupted but available at a price. Even capital requirements would not be a constraint for mortgage lending because the loans could be originated and immediately sold in the securitized mortgage market.

In general, earlier credit crunches tended to occur near cyclical peaks in business cycles and were often exacerbated by other shocks stemming from financial failures or credit restrictions. Tighter monetary policy was usually part of the scene, and market rates exceeding Regulation Q limits typically played a role, with severe consequences for the housing industry. In some cases, interest rates in excess of state usury ceilings also disrupted the flows of credit to certain sectors, predominantly housing.

In contrast, in this latest episode neither an extremely tight monetary policy nor Regulation Q ceilings played a role. Speculation and excessive lending in real estate were important factors. However, the deregulation and innovation of the 1980s were not able to prevent credit disruptions during the correction phase. Indeed, it could be argued that innovation and deregulation may have made the situation worse by enabling consumers and businesses to acquire heavy debt burdens. The accumulation of debt ultimately led to a situation in which lower desired leverage ratios from the demand side and more cautious lending from the supply side could combine to produce a substantial slowing in credit growth. Also on the supply side, advances in information technology may have put financial intermediaries in a weaker position by giving their traditional customers direct access to the money market and forcing the intermediaries to compete for lower quality lending. Weak financial intermediaries in turn contributed to the abnormally slow recovery by reducing lending to firms dependent on intermediated credit as problems with real estate and other loans made earlier became apparent. The consolidation and downsizing of the banking and thrift industries that accompanied this process seemed to produce a more cautious lending environment for strong and weak institutions and raised issues about the role of the regulators in the credit slowdown. Finally, the tax law changes in 1981 and 1986 added to the severity of the commercial real estate cycle.

No doubt, opinions about the importance of individual factors in producing the recent credit slowdown will change as more research is completed on this latest episode. Nonetheless, we believe that the factors we have cited will continue to be regarded as the salient features of the 1989-91 credit slowdown and as the features that helped distinguish it from earlier postwar episodes.

B. The credit cycle literature

Despite the differences between this credit slowdown and previous postwar episodes, earlier literature on the credit cycle, and particularly the work of Fisher and Minsky, still has relevance to the most recent experience. Indeed, a passage from Minsky's work in 1964 offers an apt analysis of the real estate problem during 1989-91:

> Once capital gains in real estate become "expected" then the development and construction of real property can be undertaken in order to take advantage of such opportunities for capital gains. An investment boom in real estate can occur, which will sustain the growth process. But a boom based upon extrapolation of existing rates of change of asset prices can result in the construction of more of such assets than current demand can use. As a result the boom in time can lead to an oversupply which in time will tend to lower asset values.
>
> If the market value of an asset declines, then the unit owning the asset has a realized or unrealized capital loss depending upon whether or not it sells the asset. These capital losses decrease the net worth of the unit if we measure all asset values as current market values. This decreases the unit's ability to borrow. If the decrease in the market value of the assets it owns is so great as to make the net worth of the unit negative, then the owners of the unit's debt liabilities will choose to exercise whatever powers they have to force payment and certainly a negative net worth unit will not be able to get its debts extended or refunded. Hence the decline in the market value of assets, by decreasing the protection that a unit's net worth provides for the lenders, decreases the likelihood that a unit which needs to acquire cash by issuing its debt can do so.
>
> The effort to meet money flow commitments by selling assets is a crucial step in the process by which financial distress is generalized into a financial crisis. If a unit needs money and the only way it can acquire money is by selling its financial or real

assets, it is putting pressure on the market for this asset. Its actions will tend to lower the price of the asset. If other units are in the same predicament, then the price of the asset will have to fall until there are units which are willing to take a position in the asset. However it is not only the units in need of money which are suffering financial losses because of the decline in the market value of this asset, but all units that own this asset.[35]

Likewise, Irving Fisher emphasized the interaction of debt and speculation in describing business and credit cycles many years ago:

> Thus, over-investment and over-speculation are often important; but they would have far less serious results were they not conducted with borrowed money. That is, over-indebtedness may lend importance to over-investment or to over-speculation. The same is true as to over-confidence. I fancy that over-confidence seldom does any great harm except when, as, and if, it beguiles its victims into debt.[36]

The most recent overinvestment cycle in commercial real estate was induced by expectations of rising asset prices and by strong demand sustained with borrowed money. Once again, the leveraging process contributed to the cycle on both the "up" side and the "down" side, as lenders pulled back as soon as it became evident that the expectations of asset prices were too optimistic. Those borrowers who routinely rolled over existing short-term debt or who took on new debt to service existing debt faced serious difficulties.

Minsky refers to these arrangements as speculative financing and Ponzi financing, respectively. Both are pivotal in the endogenous process of credit cycles because the borrowers who rely on them are vulnerable not only to changes in general economic conditions but also to disruptions in their financing arrangements when asset values decline or lender confidence falls.[37]

Minsky has repeatedly emphasized not only the endogeneity of the credit cycle but also the likelihood of periodic financial crises:

> To put my argument bluntly, the incipient financial crises of 1966, 1969-1970, and 1974-1975 were neither accidents nor the result of policy errors, but the result of the normal functioning of our particular economy. The cumulative changes that occurred in the financial structure over 1945-1965 resulted from profit-seeking activity in our economy, an economy that uses decentralized markets not only to produce and distribute but also to deal in capital assets and finance investment. As a result of normal market behavior the extraordinarily robust financial structure inherited from World War II, in which a financial crisis was a virtual impossibility, was transformed into the fragile structure we now have, in which the periodic triggering of a financial crisis is well nigh certain.[38]

Following Minsky and Irving Fisher, other economists, including Otto Eckstein and Allen Sinai, have represented credit crunches as an endogenous part of the business cycle.[39] Sinai has undertaken a substantial effort to incorporate endogenous credit cycles in a large econometric model.[40]

Other authors have also built on this earlier work. Benjamin Friedman, in commenting on the likely consequences of the increased use of debt in the U.S. economy during the 1980s, echoed a theme familiar from the work of Minsky and Fisher:

> The massive increase in business indebtedness has raised concerns that it will make the U.S. economy excessively fragile in the face of downward shocks. The chief danger posed by an overextended debt structure in this context is that the failure of some borrowers to meet their obligations will lead to cash flow inadequacies for their cred-

[35]Minsky, "Financial Crisis, Financial Systems, and the Performance of the U S Economy," p. 247 and pp 259-60

[36]Irving Fisher, "The Debt-Deflation Theory of the Great Depression," *Econometrica*, vol 1, no 4 (October 1933), p 341 For a careful analysis of Fisher's views, see Gottfried Haberler, *Prosperity and Depression* (London George Allen & Unwin, 1964). Haberler stresses.

> It may, however, readily be admitted that the repercussions of the breakdown of the investment boom are likely to be much more severe where the investments have been financed with borrowed money We may thus conclude that the "debt-factor" plays an independent role as an intensifier of the depression, but can hardly be regarded as an independent cause of the breakdown

[37]Hyman P Minsky, *Stabilizing an Unstable Economy* (New Haven Yale University Press, 1986), pp. 206-13

[38]Hyman P Minsky, "A Theory of Systemic Fragility," in Edward Altman and Arnold Sametz, eds , *Financial Crises* (New York John Wiley and Sons, 1977), p 139.

[39]We do not mean to imply that these analysts necessarily interpret this credit crunch process in exactly the same way For an interesting attempt to delineate the similarities and differences and to trace the historical origins of this view back to Thorstein Veblen and Wesley Clair Mitchell, see Wolfson, *Financial Crises*

[40]A detailed description can be found in Allen Sinai, "Financial and Real Business Cycles," *Eastern Economic Journal*, vol 18, no 1 (Winter 1992) For further discussion of credit crunches as part of an endogenous cyclical process, see Otto Eckstein and Allen Sinai, "The Mechanism of the Business Cycle in the Postwar Era," in Robert Gordon, ed , *The American Business Cycle* (Chicago University of Chicago Press, 1986), pp 39-122

itors—who may, in turn, also be borrowers, and so on—and that both borrowers and creditors facing insufficient cash flows will then be forced to curtail their spending. Similarly, forced disposal of assets by debtors and others facing insufficient cash flows will lead to declines in asset prices that erode the ability of other asset owners to realize the expected value of their holdings if sale becomes necessary, and will therefore threaten the solvency (in a balance sheet sense) of still others.[41]

More recently, Friedman has extended the logic of this argument to assign an explicit role to the "credit channel" (in the Bernanke-Blinder model) in this most recent cycle:

> A fundamental feature of debt markets, which the discussion of U.S. business leveraging has too often overlooked, is that each transaction has both a borrower and a lender. When a borrower defaults, some lender takes a loss. When a borrower's likelihood of meeting its obligations erodes, the expected value of some lender's claim declines. These losses and declines in value represent reductions in the net worth, or capital, of lenders. In a financial system in which many lenders are themselves highly leveraged intermediaries that must meet minimum capital requirements, these losses and declines in value therefore impair their ability to extend new credits or renew old ones. Especially when the intermediaries in question represent the only plausible source of credit for specific would-be borrowers—for example, in the case of small businesses with just one or a few well-developed banking relationships—borrowers' ability to obtain credit is impaired as well. In short, the entire market becomes more imperfect.[42]

In other words, deflated asset values and disruptions of cash flows lead to financial strains and reduced credit availability that can cause output to decline (or grow more slowly) as units adjust to the situation by reducing spending.[43]

In a sense, recent events, when viewed in the context of this earlier theoretical and empirical work, should not appear especially surprising. Economists have achieved a basic theoretical understanding of how financial innovation, excessive debt, financial strains, and slow growth interact, as well as an understanding of the process through which the correction occurs.

Using the information and ideas discussed in this section, we can chart how the credit cycle leads to a credit crunch and identify the important interactions between finance and economic activity. The process can be viewed as consisting of ten basic steps:

(1) There is an increase in the demand for new capital assets, that is, investment increases. This increase in investment could stem from an expansionary monetary or fiscal policy that is increasing the demand for the output or services produced by the capital assets and thereby increasing the value of these assets; or investment in the capital assets could occur because of a boom in the stock market that increases the market value of the existing assets. Alternatively, an upward shift in inflationary expectations could motivate investors to hold real as opposed to financial assets. In any case, a wider spread is opened up between the price of existing capital assets and the cost of creating (building) new capital assets, and additional investment takes place to take advantage of profit opportunities. This first step can be conceptualized either in terms of Tobin's Q model or Minsky's two-price model.

(2) These larger capital asset positions are financed with borrowed money and through reductions in overall liquidity. The assets, in turn, are often pledged as collateral, and lenders, no doubt, are aware that these asset prices are appreciating more rapidly in value, giving the lenders a false sense of security and resulting in some cases in a lowering of credit standards. At this point, finance has become an important part of the process.

(3) In some cases, maintaining the positions in these assets with borrowed money requires continually rolling over short-term debt or even increasing debt to

[41] Benjamin Friedman, "Changing Effects of Monetary Policy on Real Economic Activity," in *Monetary Policy Issues in the 1990s*, Federal Reserve Bank of Kansas City, 1989

[42] Benjamin Friedman, "Financial Roadblocks on the Route to Economic Prosperity," *Challenge*, March-April 1992, pp 25-34

[43] Central to the views of the analysts reviewed in this section is the notion that large debt burdens can be destabilizing Similar arguments can be found in Henry Kaufman, "Debt The Threat to Economic and Financial Stability," and Benjamin Friedman, "Increasing Indebtedness and Financial Stability in the United States," in *Debt, Financial Stability, and Public Policy* In more recent work, some analysts have de-emphasized the level of debt

Footnote 43 continued
burdens per se, and have focused more on the equity positions of borrowers, arguing that as borrowers risk less of their own wealth in a given project, they have less in common with the interests of their lenders. For more detail, see Ben Bernanke and Mark Gertler, "Financial Fragility and Economic Performance," *Quarterly Journal of Economics*, February 1990, pp 87-114 Still others argue that heavy debt burdens are actually good for corporations because managers have less uncommitted cash flow to use for inefficient investments See Michael Jensen, "Takeovers: Their Causes and Consequences," *Journal of Economic Perspectives*, vol 2 (1988), pp 21-48

make interest payments on existing debt. These financing arrangements increase the vulnerability of the financial system to shocks

(4) At some point, expectations about increased profits and continued asset price appreciation shift downward, perhaps because of a slowing in aggregate demand as monetary or fiscal policy tightens to control inflation, or because of an external shock to the economy. A third possible explanation is that a large increase in the supply of assets comes on the market with a lag in response to the earlier large price increases, putting downward pressure on the price of the output or services produced by these capital assets. In any case, the capital assets, new and existing, do not produce the expected cash flows and profits, and asset prices begin to decline

(5) Falling collateral values and the resulting decline in the equity positions of debtors, along with the reduced ability of debtors to make the payments on their loans, create a divergence in the interests of debtors and lenders debtors are looking to refinance under difficult circumstances and lenders want to be repaid while debtors still have positive equity (here begins the credit crunch part of the story)

(6) Expected cash payments are not received and loans are not rolled over, spreading distress among more economic units

(7) Assets are dumped on the market to raise cash, and asset prices decline further. At this point, some players may become insolvent; a process of contagion can raise questions about other players (both debtors and lenders), who may be perceived to be in a similar situation or to have similar exposures In this climate of uncertainty, investors may begin a general flight to quality (possibly creating the need for lender-of-last-resort intervention)

(8) Some of the loans become nonperforming and eventually are written off by the financial intermediaries.

(9) As a result, highly leveraged financial intermediaries take a hit to their capital, an outcome that leads to greater regulatory scrutiny and impedes the intermediaries' ability to make loans to financially sound economic units. What Bernanke, Blinder, and others call the "credit channel" becomes blocked to at least some degree. Through this channel, the credit crunch can be spread to economic units that were not part of the "excesses" that created the credit crunch

(10) Economic units, sound and weak alike, adjust to the situation by reducing their spending, and economic activity slows further, prolonging the period of substandard economic performance.

When a credit crunch (steps 6 through 9) is viewed in terms of a more general credit cycle model, it appears that the unique features of each cycle will tend to be the individual "accidents" or the particular points of stress rather than the process itself, although clearly the cyclical swings themselves can be amplified by deregulation, financial innovation, the level of debt burdens, tax law changes, and other institutional changes. The credit cycle model outlined here is general enough to be consistent with the view that the credit cycle is an inherent feature of our financial system or with the view that credit cycles are generated by monetary or fiscal policy or other exogenous shocks. Whatever the precise nature of the credit cycle may be, such episodes underscore the importance of the relationships between finance and economic activity during both the expansion and the contraction phases of the investment cycle.

V. Concluding remarks

We conclude our discussion by offering a few, more speculative reflections in light of the recent credit slowdown experience

(1) The credit cycle phenomenon, with its interaction of supply and demand side factors on both the "up" side and the "down" side of the business cycle, appears to have contributed significantly to the recent period of recession followed by weak recovery Nevertheless, it has by no means been the only factor in this experience Other factors include the beginning of the Gulf War, the defense build-down following the end of the cold war, and the pressure on U S. companies to engage in major corporate restructuring and to reduce personnel now perceived to be redundant in a more internationally competitive environment

(2) The credit cycle phenomenon has not been unique to the United States; indeed, it has been a conspicuous factor in many other countries, including the United Kingdom, Australia, Japan, and some Scandinavian countries

(3) One of the most striking features of the recent credit cycle has been the crisis that never happened True, many shocks occurred in the form of failures of major financial and nonfinancial firms, and during some periods financial markets and institutions seemed quite vulnerable to such shocks. Moreover, the cumulative adverse effects of a prolonged period

of weak business activity were no doubt quite substantial. Still, no crisis of the kind that accompanied prewar credit cycles took place in 1989-91. Earlier crises often took the form of massive waves of bankruptcies, sudden forced dumpings of financial and commodity assets on vulnerable markets, and sharp liquidity shortages leading to steep spikes in short-term rates and sharply inverted yield curves. The failure of such a crisis to occur this time *may* reflect the successful application of more flexible monetary policy tools and federal deposit insurance, resources that were unavailable or available to a much lesser extent in earlier episodes.

(4) Efforts to devise single-cause theories of the business cycle are probably misplaced Business fluctuations probably can stem and have stemmed from various causes at different times and in different places But the phenomenon of credit cycles, as outlined here and as experienced in the recent past, must figure importantly in any realistically eclectic theory of the business cycle.

Appendix: Definitions of Terms

This appendix provides more precise definitions of terms used in the text to describe various credit phenomena. We define a *credit slowdown* as a general decline in credit growth that may have been caused by either demand or supply factors, or both Broad changes in the demand for credit may be cyclically induced, varying with the pace of economic activity, or structurally induced, responding to changes in the tax code or to managerial innovation such as just-in-time inventory control Credit supply can be affected by changes in financial regulations, structures, and institutions. Both credit supply and demand will be influenced by monetary policy and by "autonomous shifts" in lender and borrower psychology

While *credit slowdown* is a fairly inclusive term, *credit crunch* refers specifically to a reduction in the available supply of credit.[†] During previous credit crunches, lenders often became reluctant to lend either because they had funding problems stemming from disintermediation or because their regulators had urged credit restraint. In the current episode, however, the reluctance to lend may have resulted from lenders' own balance sheet weaknesses (capital constraints) and their reassessments of borrowers' average credit quality. Although we regard credit crunches as primarily supply phenomena, it is difficult to disentangle supply from demand effects because some of the same factors that may reduce the willingness to lend may also restrain the desire to borrow. During the recent credit slowdown, for example, the decline in the strength of borrowers' balance sheets and the decline in the profitability of most real estate investments reduced the willingness both to lend and to borrow.

A credit crunch implies changes in the relationship between credit availability and interest rates (1) less credit may be available over a wide range of interest rates, a condition consistent with a shift in a credit supply schedule, or (2) the reduction in credit availability may bear little relation to the level of rates, a condition that occurs when allocation takes place through nonprice mechanisms. Because credit is normally allocated across potential borrowers by the interest rate, common usage reserves the term *credit rationing* for situations in which the supply of credit is allocated through nonprice mechanisms We consider credit rationing episodes to be a subset of credit crunches in which the interest rate is not the price credit allocation mechanism.[‡] Credit crunches that are characterized by credit rationing may be difficult to alleviate with monetary policy alone

During a credit crunch with rationing, borrowers may perceive changes in the terms on which credit is made available, such as qualifying standards or the length of the business relationship. These nonprice terms of credit are often relied upon to sort borrowers as lenders try to cut back on loans When the nonprice terms of credit change, borrowers and lenders may have differing opinions about whether credit standards have tightened. This occurs, for example, when lenders but not borrowers reduce their valuations of certain forms of collateral or their estimates of the likely profitability of certain investment projects If a credit slowdown arises from balance sheet concerns and a credit crunch is associated with changes in the nonprice terms of credit, there may be little effective trade-off between the level of interest rates and credit availability

As deregulation and recent financial innovations gave market forces a greater role in allocating available credit, it was expected that abrupt disruptions of credit flows

[†]Most analysts regard credit crunches as disruptions in the credit supply process A review of the various definitions that have appeared in the literature can be found in Raymond Owens and Stacey Schreft, "Identifying Credit Crunches," Federal Reserve Bank of Richmond, Working Paper no 92-1, March 1992

[‡]Owens and Schreft, in "Identifying Credit Crunches," argue that nonprice rationing is a defining characteristic of credit crunches, however, they acknowledge that the economic profession is split on this issue

Appendix: Definitions of Terms *(Continued)*

through rationing would diminish Instead, the last decade witnessed an apparent "overshooting" of equilibrium credit levels, and the excess credit growth was corrected through both rationing and interest rate changes A credit crunch today that exhibits elements of credit rationing may still have particularly adverse macroeconomic consequences if the flow of credit is shut off for critical markets or borrowers

Credit rationing can take three forms[§] During the recent credit crunch, all three may have appeared in combination

Pure rationing occurs when some borrowers are denied credit while otherwise identical borrowers receive credit In this case, the lender has set an interest rate at which the demand for funds exceeds the supply Theoretical models show that this behavior is an efficient response to potential adverse selection problems setting a higher interest rate may attract only riskier borrowers

Divergent views rationing occurs when borrowers would like to borrow at prevailing rates and feel their loans do not present a serious credit risk, but the lenders disagree and refuse to lend In this situation, borrowers who cannot obtain credit at the prevailing interest rate may conclude that the lenders are rationing credit Borrowers and lenders often differ on the appropriate criteria for judging the ability to take on debt For example, lenders may place more weight on collateral valuation, whereas borrowers may focus on their projected cash flow and ability to stay current with interest payments Even when borrowers and lenders agree on the appropriate criteria, they may have different forecasts for future asset prices and cash flows

Sectoral rationing refers to the application of credit standards that effectively shut off the flow of credit to entire sectors, such as certain classes of borrowers or types of borrowing For some borrowing sectors, lenders may find it difficult to distinguish between good and bad credits and therefore choose to make no loans at all Sectoral rationing appears in combination with divergent views rationing when borrowers have private information or different views about their own creditworthiness

In the current slowdown, divergent views and sectoral credit rationing clearly increased, particularly in the commercial real estate sector and for borrowers whose loans would be classified as highly leveraged transactions Pure credit rationing probably appeared in combination with these other forms of rationing as banks sought to reduce the size of their overall balance sheets

[§]This discussion closely follows the literature review by Dwight Jaffee and Joseph Stiglitz, "Credit Rationing," in Benjamin Friedman and Frank Hahn, eds , *Handbook of Monetary Economics*, vol 2 (1990), pp 838-88

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