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VIEWS ON THE LIKELIHOOD OF FINANCIAL CRISIS

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ABSTRACT

A review of major lines of thinking about developments in the 1980s bearing on the likelihood of a financial crisis in the United States supports four principal conclusions:

First, financial crises have historically played a major role in large fluctuations in business activity. A financial crisis has occurred either just prior to, or at the inception of, each of the half dozen or so most severe recorded declines in U.S. economic activity. Second, the proclivity of private borrowers to take on debt since 1980 has been extraordinary by postwar standards. Among business corporations, much of the proceeds of this surge in debt issuance has gone to pay down equity (either the borrower's or another company's) rather than to put in place new earning assets. Third, the rate at which U.S. businesses have gone bankrupt and defaulted on their liabilities has also been far out of line with any prior experience since the 1930's. The business failure rate not only rose to a postwar record level during the 1981-82 recession but -- in contradiction to prior cyclical patterns -- continued to rise through the first four years of the ensuing recovery. Fourth, the largest U.S. banks' exposure to debt issued in the course of leveraged buy-outs or other transactions substituting debt for equity capitalization now exceeds their risk-adjusted capital, even with all bank assets (including loans to developing countries) counted at book value. Although this exposure is not (yet) as large as that due to banks' LDC loans, the two sets of risks are not independent.

If these trends of the 1980s together comprise an increase in the economy's financial fragility, they increase the likelihood that the government -- including, but not limited to, the Federal Reserve System -- will have to act in its capacity as lender of last resort, and also the likely magnitude of lender-of-last-resort action should such be necessary. If the exercise of this responsibility does become necessary, doing so in a fashion consistent with other Federal Reserve objectives, like maintaining price stability, will be problematic to say the least.

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VIEWS ON THE LIKELIHOOD OF FINANCIAL CRISIS

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Financial crises have traditionally attracted a peculiar fascination. It is difficult to specify with precision just what a financial crisis is, but most people in the business and financial world apparently sense that they would recognize one if they experienced it. More importantly, the fear of financial crisis is often a key motivation underlying actions in both the private and public policy spheres.

Concern about the likelihood of a financial crisis in the United States has become more widespread in recent years, for several reasons. First, the wave of restructurings and reorganizations that has affected much of U.S. corporate business in the 1980s has, in one way or another, typically involved the substitution of debt for equity capitalization. As a result, the corporate sector's interest burden has risen sharply compared to its earnings, thereby prompting questions about the ability of more heavily indebted firms to meet their obligations in the event of a general slowdown in nonfinancial economic activity. This substitution of debt for equity has not merely involved a few individual transactions large enough to attract attention under any circumstances -- $25 billion for RJR-Nabisco, for example -- but has also reached a scale that is hard to ignore at the aggregate level. During the six years 1984-89, the volume of equity that U.S. firms in nonfinancial lines of business retired, through various restructuring transactions, exceeded the gross proceeds of nonfinancial firms' new equity issues by $575 billion.

Second, the actual record of failures of both nonfinancial firms and financial intermediaries has been extraordinary in the 1980s. The business expansion following the severe 1981-82 recession was the first on record in which the failure rate among nonfinancial businesses continued to rise long after the recession ended, rather than dropping back to pre-recession levels. Moreover, on inspection it is clear that this phenomenon has not been merely the natural counterpart of an unusually large number of new business start-ups. (Contrary to popular impressions, the 1980s has not been an unusually fertile period for new business formation activity in the United States.) Within the financial intermediary system, both the actual failure experience and the perceived threat of further failures have been unprecedented since the 1930s. More than 1,000 commercial banks failed during 1981-89 -- including 206 in 1989 alone -- versus only 79 during the 1970s and only just 91 from the end of World War II through 1970. After watching hundreds of savings and loan institutions become insolvent in the 1980s, yet continue to operate anyway because the FSLIC (unlike the FDIC) lacked the resources to close them, in 1989 Congress voted a bail-out plan for the thrift industry that will cost far in excess of $100 billion.

Yet a third reason for the increased worry about a financial crisis is the shock of the October 1987 stock market crash. Unlike many previous dramatic declines in stock prices, the drop of 23% in one day (or 33% compared to the peak two months earlier) led to neither a financial crisis nor a business recession. But the crash vividly demonstrated that the vulnerability of values already experienced in recent years in the markets for more specialized assets -- for example, farm land, oil reserves, and loans to developing countries -- also extended to so general a class of assets as ownership claims on all of American business. Further, the manifest failure of various "portfolio

insurance" schemes to serve their intended purpose cured many institutional investors of the illusion that even if a financial crisis did bring a broadly based decline in asset values, their own holdings would somehow be insulated.

These developments notwithstanding, prevailing attitudes toward the possibility of financial crisis are neither unanimous nor unambiguous. The most familiar concern is that some contractionary disturbance to business activity could result in a cumulative inability of debtors to meet their obligations, possibly leading to some form of rupture in the financial system that in turn might further depress the nonfinancial economy. But no one (to the author's knowledge) has clearly indicated what set of circumstances would lead to such an outcome, much less suggested how probable those circumstances now are. In addition, there are some arguments for discounting the importance of the changes that have taken place in this regard in the 1980s. For example, some observers have argued that most of the substitution of debt for equity in recent years has occurred in the context of reorganizations that are likely to promote business efficiency, and hence provide the higher earnings with which to service the added debt, and also that these transactions are explicitly designed to minimize conventional bankruptcy problems in the event that the anticipated higher earnings do not materialize. Others have pointed out that even after the refinancings of the 1980s, U.S. corporations on average remain much less highly levered than their counterparts abroad.

Whether or not they are valid under today's specific circumstances, concerns about the likelihood of a financial crisis do reflect a long history of such events playing a major role in the most visible and memorable business fluctuations. The most severe business downturns that have occurred in the United States -- for example, the ones commonly called "depressions" -- have in every case been either preceded or accompanied by a recognizable financial

crisis. Moreover, while each financial crisis is idiosyncratic in some respects, according to at least some lines of thinking the role of financial crises in this context is not accidental but fundamental to economic behavior in an investment-oriented private enterprise system. At the same time, there is widespread recognition that the likelihood that such a system will experience a financial crisis under any given set of circumstances also depends on institutional safeguards and other factors subject at least in part to influence by public policy.

The object of this paper is to review some of the major lines of thinking about the likelihood of a financial crisis that have emerged in response to the events of the 1980s. Section I briefly sets this review in context by referring to the long-standing tradition of emphasis on financial crises and their real economic consequences. Section II outlines the view that the large-scale substitution of debt for equity by U.S. nonfinancial corporations during the 1980s reduced the economy's ability to sustain fluctuations in business activity without borrowers' defaulting on their obligations in unusually great numbers and volume. By contrast, Section III examines several different arguments for rejecting concerns about borrowers' ability to meet their obligations. Section IV shifts the focus from borrowers to lenders, and considers the ability of both commercial banks and thrift institutions to withstand a default experience of major proportion. Section V summarizes the paper's principal conclusions.

I. Financial Crises in Historical Perspective

Few students of economics or business are not familiar with some of the major episodes in the past that are easily recognizable as financial crisis. The bursting of the "tulip mania" in 1636 and of the "South Sea Bubble" in 1720, the East Indian Company crisis in 1772, the collapse of the railway boom in 1846, the failure of Union Generale in 1881 and of Baring Brothers in 1890, the U.S. banking panics of 1873, 1893 and 1907, the failure of the Creditanstalt in 1931 and the worldwide bank collapse of the next two years, and of course Black Thursday in October 1929: all this is standard lore, typically related nowadays with substantial color and even sometimes a hint of nostalgia.[1] In fact, although financial crises as such are more difficult to recognize in more primitive institutional environments, the history of such episodes is substantially more ancient.[2]

The typical features of these events include, in Minsky's classic description, "large-scale defaults by both financial and nonfinancial units, as well as sharply falling incomes and prices."[3] Beyond that, however, it is difficult to generalize. Some financial crises have been the inevitable (at least in retrospect) end product of speculative excesses that carried asset prices to levels far beyond any plausible relationship to the corresponding fundamental values. Others -- especially those that have followed the onset of war, or other major political events -- have presumably resulted from sudden re-assessments of fundamental values themselves. Still others have resulted from foolish decisions, or bad luck, at specific financial institutions that were large enough and central enough to impair the system as a whole when they failed to honor their commitments. Yet another entire range of influences, not mutually exclusive with any of the above, has typically arisen from the nonfinancial economy. Incomes can and do decline for reasons other than

financial crisis. And when they do, on a sufficient scale, the ensuing defaults have at times led to crises in the financial system.

While events in the nonfinancial economy may or may not be the proximate cause of financial crises, the main reason why financial crises are of such great interest from a public policy perspective is presumably the impact that they in turn exert on nonfinancial economic activity. The idea of influences running in this direction is also well known, even if the substantive nature of the behavioral mechanisms involved is not. Of the six U.S. economic downturns during 1867-1960 considered to have been severe by Friedman and Schwartz (1963), banking crises either preceded or accompanied the onset of four -- those beginning in 1873, 1893, 1907 and 1929.[4] The bank panic of 1837 also apparently played a major role in accounting for the severe economic downturn that began in that year.[5] Sharp declines in stock prices also occurred in each of these five years. Among U.S. economic downturns of lesser magnitude, banking panics occurred in conjunction with (although not necessarily at the inception of) those beginning in 1857, 1882, 1899 and 1902.

Not surprisingly, growing awareness of the effect of financial crises on the nonfinancial economy often prompted a policy response. The two leading examples in the United States within the twentieth century were the establishment of the Federal Reserve System in the aftermath of the panic of 1907 and the severe recession of 1907-08, and the separation and reform of the banking and securities industries after the 1929-33 depression. Minsky's interpretation of the post-depression banking changes is especially apt: "As the institutions were reformed at a time when the lack of effectiveness and perhaps even the perverse behavior of the Federal Reserve System during the great downswing was obvious, the changes created special institutions, such as the various deposit and mortgage insurance schemes, which both made some of the

initial lender of last resort functions automatic and removed their administration from the Federal Reserve System."[6]

Despite the general agreement on the desirability of shielding the nonfinancial economy from effects due to financial crises, the way in which these effects operate remains unclear. Friedman and Schwartz emphasized the role of financial crises in creating sudden reductions in the quantity of money held by the public, especially during episodes involving widespread bank failures or (as in the panics of both 1893 and 1907) suspensions of convertibility of deposits into currency. By contrast, Fisher's (1933) notion of "debt deflation" focused on the market for credit rather than money. More recently, Bernanke (1983) and Mankiw (1986) have further developed Fisher's idea by making explicit the role of banks as specialized institutions able to allocate credit on the basis of their superior ability to collect and process relevant information about would-be borrowers and their prospects. By compromising banks' (and perhaps other specialized lenders') ability to serve this function, a financial crisis therefore removes a necessary ingredient to many spending decisions.

Not everyone has regarded the nonfinancial consequences of occasional financial crises as wholly bad, however. Schumpeter (1934), for example, focused on the role of severe business downturns in freeing economic resources to move to more productive uses. Without a fairly severe downturn from time to time, the varied relationships and habits that make up the fabric of everyday business dealings would tend to lock both people and capital in place, even if technology and other conditions determining the best allocation of the society's resources were changing over time. According to Schumpeter the positive role of occasional financial crises, including especially the

widespread abrogation of contracts, is to provide enough pressure to break through these rigidities.

Finally, under any of these notions of how financial crises affect nonfinancial economic activity -- the money-destruction view of Friedman and Schwartz, or Fisher's debt-deflation alternative, or even Schumpeter's more benign perspective -- there remains the question of whether financial crises themselves occur in a purely random fashion or more systematically. The most intriguing idea advanced along these lines, and the one that bears most directly on the current situation in the United States, is Minsky's "financial instability hypothesis," according to which as time passes since the last financial crisis, the relevant behavior changes in such a way as to increase the likelihood of the next crisis.[7] In particular, either borrowers take on more debt relative to their earnings, or they (and perhaps lenders too) hold relatively less liquidity, or both. But for a shock of any given size to the typical borrower's earnings, the probability of experiencing defaults on a scale sufficient to impair the functioning of the system as a whole depends both on the volume of debt to be serviced and on the reserve of liquidity behind it. For a given distribution of shocks to which the economy is subject in the ordinary course of events, therefore, the likelihood of a financial crisis rises over time as the memory of the last such crisis fades. Whether the specific changes in the behavior of borrowers and lenders that have attracted so much attention during the 1980s correspond well or poorly to Minsky's hypothesis remains an open question.

II. Concerns about Corporate Indebtedness

The phenomenon of the 1980s that has accounted for the greatest part of the spreading concern about the U.S. economy's vulnerability to financial crisis is the leveraging of the nonfinancial corporate business sector. As Kaufman and Friedman (among others) have emphasized, corporate borrowing in the last decade has differed from prior experience both in scale and in purpose.[8] U.S. businesses have not only borrowed in far greater volume than in the past, but have used a much greater share of the proceeds of that borrowing to pay down their own and other companies' equity rather than to put in place new earning assets. As a result, the share of earnings, or cash flow, that the typical company needs to devote to keeping current on its debt service has risen to record levels.

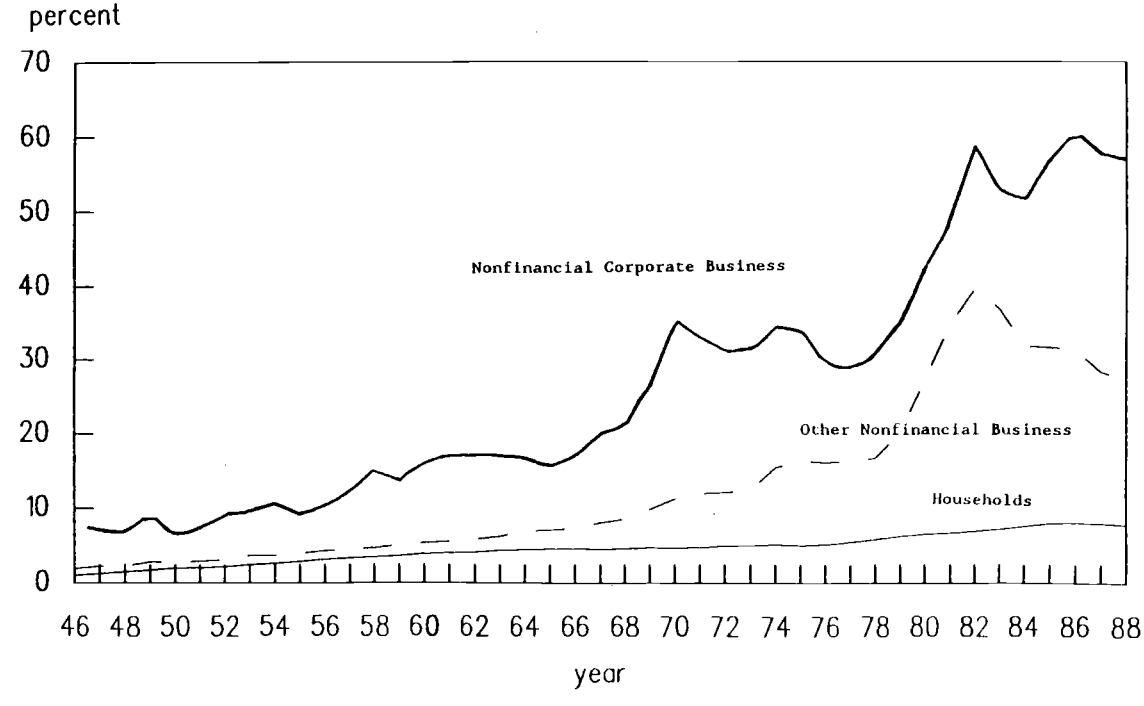
Figure 1 documents this increased interest drain at the aggregate level by showing the ratio of interest payments to available earnings before interest and taxes, since World War II, for corporate and noncorporate firms engaged in nonfinancial lines of business in the United States. For purposes of comparison, the figure also shows the ratio of personal interest payments to pre-tax personal income.

Especially for the corporate sector, the deterioration of interest coverage since 1980 has been dramatic. On average during the 1950s and 1960s, it took 16 cents of every dollar of pre-tax (and pre-interest) earnings to pay corporations' interest bills. The corresponding average for the 1970s was 33 cents. Thus far in the 1980s it has been 55 cuts. In no year since 1981 has the interest share of earnings been below 50 cents on the dollar.

Indeed, the corporate sector's experience in this regard since 1981 vividly demonstrates the impact of continued massive borrowing for purposes of equity substitution rather than asset creation. In 1982, at the bottom of the

Figure 1

Interest Payments As A Share Of Available Earnings



Source: Bureau of Economic Analysis

most severe business downturn since the 1930s, aggregate pre-tax corporate earnings (before interest payments) were depressed by 11% from year-earlier levels, and the interest rate on short-term business borrowing reached a record 16.66% (in May). Not surprisingly, the share of corporations' earnings required to meet their interest bills also rose to a record level, 59 cents out of every dollar. By 1986 earnings had rebounded by 25%, and the average short-term borrowing rate was down to 6.39%. But by then corporations had taken on so much additional debt that in 1986 interest payments were up to 60 cents of every dollar of earnings, yet a new record. By 1988 earnings had risen still further, to 37% above the 1986 level, and the average short-term borrowing rate was 7.68%. But with the further borrowing that had taken place, interest payments still stood at 57 cents of every dollar of earnings.

The experience of unincorporated businesses resembled that of corporations until the 1980s, but since then it has differed sharply. Mirroring the corporate sector's interest-to-earnings ratio, the noncorporate sector's interest payments rose from only 6 cents of every dollar of pre-tax (and pre-interest) earnings on average in the 1950s and 1960s to 17 cents on average in the 1970s, and 33 cents in the 1980s. But after peaking at 40 cents on the dollar in 1982 -- to recall, the bottom of the recession -- interest payments as a share of earnings dropped to only 27 cents on the dollar by 1988.

In contrast to the case of either corporations or unincorporated businesses, the trend of household sector interest payments in the 1980s has shown no noticeable break with prior experience. Personal interest payments averaged 4 cents of every dollar of pre-tax (and pre-interest) personal income in the 1950s and 1960s, and 5 cents in the 1970s. Thus far in the 1980s the average has been 8 cents. As of 1988 the ratio had been essentially unchanged

for half a decade, with the value for every year during 1984-88 falling within the narrow range of 7.6-8.0 cents on the dollar.

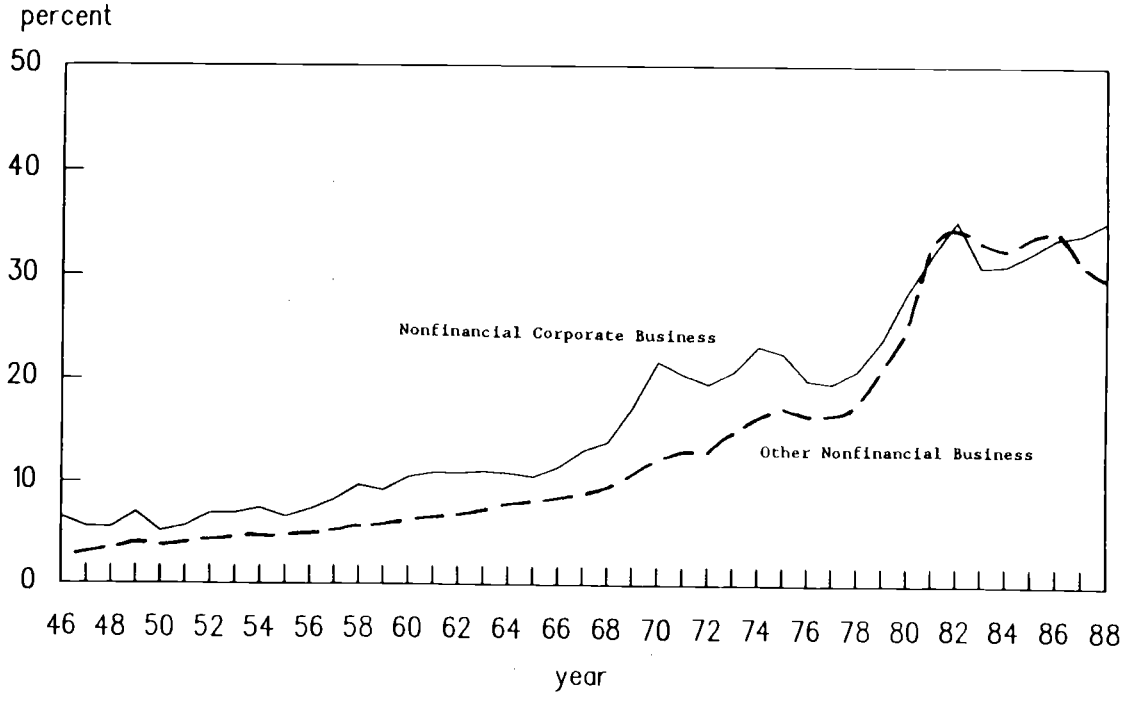
Finally, Figure 2 presents an alternative perspective on business borrowers' ability to meet their current obligations by showing, separately for the corporate and noncorporate sectors, the ratio of interest payments to cash flow including earnings (as in Figure 1) plus depreciation. Interest payments look smaller compared to this expanded measure of ability to pay, of course, but the overall trends are roughly the same as those shown in Figure 1. Most importantly, the corporate sector's ratio of interest payments to cash flow also rose dramatically during the late 1970s and the back-to-back recessions of 1980 and 1981-82, and, despite the strong recovery of cash flow and the general fall in interest rates, as of 1988 it had shown no improvement whatever from the bottom of the last recession.

The basic reasons underlying the disparate patterns of interest payments compared to earnings (or cash flow) among corporations, unincorporated businesses and households are readily apparent from Table 1, which summarizes the changes in these three sectors' respective balance sheets between 1980 and 1989 (scaled in each case relative to gross national product). Not surprisingly, since all three sectors have borrowed in record volumes during the 1980s, the heart of the issue in the resulting comparisons is their differing use of the proceeds of borrowing.

Between 1980 and 1989 the corporate sector increased its overall debt by nearly one-fourth, and its market debt by more than one-third, relative to the size of the economy. By contrast, with investment unusually weak during the 1980s (presumably as a result, at least in part, of the extraordinarily large federal budget deficit, which persisted long after the economy had recovered from the recession that began the decade), total corporate asset holdings

Figure 2

Interest Payments As Share Of Cash Flow
1946 - 1988



Source: Bureau Of Economic Analysis

TABLE 1

BALANCE SHEET CHANGES, 1980-1989

	1980	1989	Change	% Change
Corporate Sector				
Assets	140.5	126.3	-14.2	-10.1
Tangible	104.9	91.4	-13.5	-12.9
Financial	35.6	34.9	-0.7	-2.0
Liabilities	45.1	56.3	11.2	24.8
Market	29.1	39.3	10.2	35.1
Other	16.0	17.0	1.0	6.2
Net Worth	95.4	70.0	-25.4	-26.6
Noncorporate Sector				
Assets	60.9	63.4	2.5	4.1
Tangible	55.7	55.0	-0.7	-1.3
Financial	5.2	8.5	3.3	63.5
Liabilities	18.2	27.5	9.3	51.1
Market	15.7	23.7	8.0	51.0
Other	2.5	1.3	-1.2	-48.0
Net Worth	42.7	35.9	-6.8	-15.9
Households				
Assets	365.9	388.6	22.7	6.2
Tangible	136.0	132.1	-3.9	-2.9
Financial	229.9	256.5	26.6	11.6
Liabilities	52.3	66.5	14.2	27.2
Home Mortgages	33.1	43.8	10.7	32.3
Other	19.2	22.7	3.5	18.2
Net Worth	313.6	322.1	8.5	2.7

Notes: Data (except for % changes in final column) are yearend values expressed as percentages of fourth-quarter gross national product (at seasonally adjusted annual rates).

TABLE 1 (Continued)

BALANCE SHEET CHANGES, 1980-1989

Notes: Tangible assets measured at reproduction cost for reproducible assets, and market value for land.

Financial assets measured at book value for debt and deposits, and market value for equities.

Detail may not add to totals because of round.

Source: Board of Governors of the Federal Reserve System.

declined by about one-tenth compared to the size of the economy and corporate holdings of tangible assets declined by somewhat more. In short, corporations were borrowing not to invest but to finance transactions -- including mergers, acquisitions, stock repurchases, and leveraged buy-outs -- that merely paid down their own or other corporations' equity. As a result, the corporate sector's aggregate net worth declined by more than one-fourth compared to the size of the economy.

Both the noncorporate business sector and the household sector likewise increased their respective debt levels faster than the economy grew, but in both cases this borrowing financed at least some relative increase in asset holding. Among unincorporated businesses the increase in assets held (all of which was in financial assets) trailed well behind the increase in borrowing, so that net worth also declined substantially in relative terms -- albeit not by anything like the comparable decline for corporations. Households also, at least in the aggregate, used much of their record borrowing in this decade to finance increased holdings of financial assets, so that household sector net worth modestly increased compared to the size of the economy.[9]

It is always possible, of course, that because balance sheet data like those summarized in Table 1 value reproducible tangible assets at reproduction cost, and exclude intangible assets ("good will") altogether, they understate the true earning power of assets in general and corporate assets in particular. If so, then despite the sharp rise in interest payments as a share of corporate earnings and cash flow in the recent past, earnings in the near future may increase rapidly enough to reverse the adverse trends shown in Figures 1 and 2. Investigating this possibility is far from straight forward because of the obvious difficulty of measuring assets' prospective earning power. (Standard book values are irrelevant for this purpose.) Nevertheless,

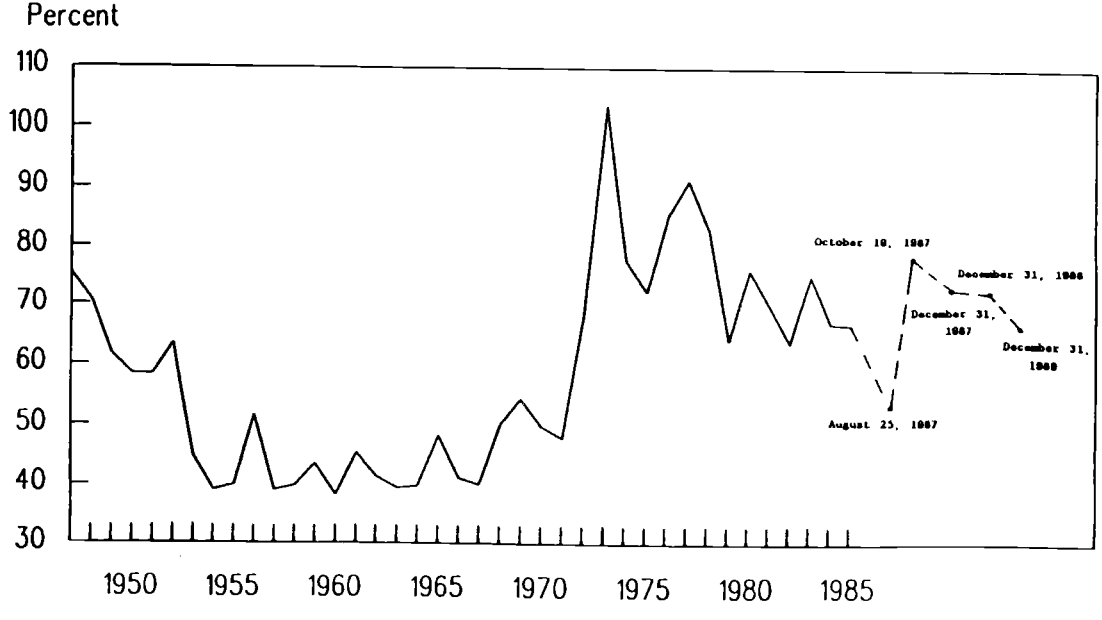
the possibility of undermeasurement of assets in this way is sufficiently important to warrant making at least some attempt to grapple with the issue.

The stock market, where prices in principle reflect market participants' collective judgment about future earnings, provides one way of doing so for the corporate sector. Figure 3 plots the ratio of the book value of debt to the market value of equity for the aggregate of U.S. nonfarm nonfinancial business corporations, for yearend values since World War II and two other selected dates: August 25, 1987 (the stock market peak), and October 19, 1987 (the market crash).[10] The results of this calculation shed little new light on the issue at hand, however. As of yearend 1989, the corporate sector's market-value leverage remained well below the post-war record level (above 1.0) set in 1974, when firms borrowed heavily and then the stock market crashed. But it likewise remained substantially above the average level that prevailed before then. Viewed from another perspective, aggregate leverage at yearend 1989 stood about where it did at yearend 1980, or at the end of the 1981-82 recession, despite that fact that by December 1989 stock prices had fully regained the record level previously reached in August 1987.

It is also always possible that the impression given by the sector-aggregate data in Figures 1-3, or in Table 1, may not correspond to the reality of borrowing and asset accumulation by individual firms and families. In fact that the household sector as a whole has accumulated substantial assets to match its record issuance of debt in the 1980s would be of limited help in the event of an economic downturn if the families who had bought the assets had little or no overlap with the families that had issued the debt. For analogous reasons, the fact that the corporate sector as a whole has borrowed far in excess of its creation of new assets in the 1980s would not increase the economy's financial fragility if the firms that had done the borrowing were

Figure 3

Debt-Equity Ratio, U.S. Non-Farm Nonfinancial Corporate Business Sector 1948–1986, and Selected Dates 1987–1989



Source: Board Of Governors of the Federal Reserve System, Flow of Funds Accounts; and author's calculations

mostly ones that had had only little debt, or excess liquidity, to begin with. Investigating the possibility of such a divergence between the aggregate data and the disaggregated reality is difficult for the household sector because of the paucity of available information on individual families' holdings.[11] By contrast, disaggregated data on the corporate sector are readily available, at least for the larger firms.

Bernanke and Campbell (1988) and Bernanke et al. (1990) used data from the Compustat files to study the detailed balance sheet and earnings record of some 1,400 U.S. corporations for years beginning in 1969. On the whole, their findings from these disaggregated data reinforce rather than contradict the impressions drawn above on the basis of aggregate data. For the median firm in their sample, interest expense rose from 13 cents of every dollar of cash flow in 1969 to 22 cents in 1988. For firms in the 90th percentile for this ratio, however, interest expense rose from 34 cents of every dollar of earnings in 1969 to $1.86 in 1988. (In other words, by 1988 more than one firm in ten was not earning its interest due). Nor did this sharp deterioration reflect merely the vagaries of one year's earnings. Compared to a trailing three-year average of earnings, interest expense for firms in the 90th percentile rose from 44 cents on the dollar of in 1971 to $1.48 in 1988.

An especially interesting exercise carried out by Bernanke and et al. was to "replay" the 1981-82 recession in the sense of considering the implications of the actual 1981-82 percentage decline in firms' earnings in the context of the typically higher debt levels taken on by 1988. The results indicated that, in the absence of some offsetting factor, default levels in such an event would have substantially exceeded those experienced during the 1981-82 recession itself. By the second year of the recession, for example, firms in the 90th percentile of indebtedness would have had negative cash

flow, and firms in the 75th percentile would have had interest due equal to 72 cents of every dollar of cash flow.

These results are all the more striking in that firms in the Compustat sample apparently did much less borrowing than the average U.S. corporation, and likewise accounted for a disproportionately small share of equity repurchases. In 1988, for example, firms in Bernanke et al.'s sample raised just $41 billion from debt issues (net of repayments), versus $198 billion for the nonfarm nonfinancial corporate business sector as a whole (as measured by the Flow-of-Funds Accounts). Similarly, firms in their sample repurchased only $26 billion of equity in 1988, versus $131 billion for the nonfinancial corporate sector overall.

In sum, the concerns raised by Kaufman and Friedman on the basis of sector-aggregate data for balance sheets as well as interest expense compared to earnings (or cash flow) appear to stand up not only against correction for market value of firms' equity but also against the use of individual firm data.

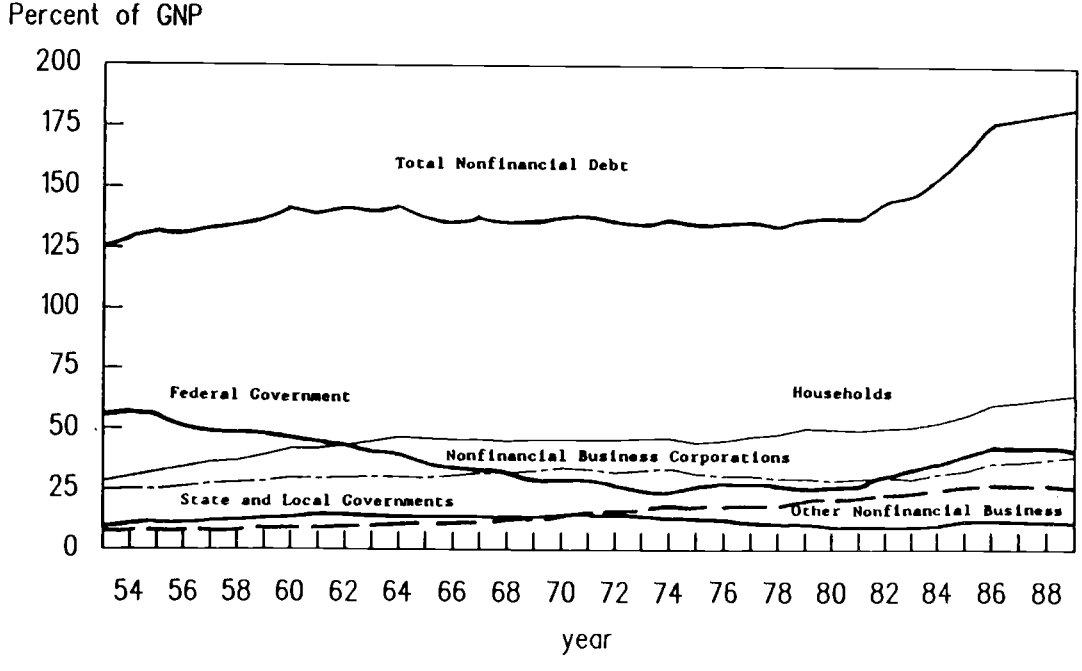
III. Contrasting Viewpoints

Public discussion of the developments summarized in Section II has not one-sidely concluded that these trends represent any threat to the U.S. economy, however. Both academic researchers and financial practitioners have advanced a series of arguments to the effect that the increasing reliance on debt by U.S. business corporations in the 1980s has not yet exposed the economy to any significant risk of financial fragility, nor is it likely to do so in the foreseeable future.

Perspectives on Debt Aggregates. To begin, Summers (1986, 1989) has emphasized the fact that the increasing aggregate indebtedness of both business and household borrowers in the 1980s has represented no more than a continuation of trends that had already prevailed over most of the post World War II period. Figure 4 shows the total outstanding indebtedness of all U.S. borrowers other than financial intermediaries, scaled in relation to gross national product, for yearend values since the end of the Korean War. The behavior of the economy's total debt ratio was certainly extraordinary in the 1980s. Until the last decade, one of the most striking features of U.S. postwar financial behavior had been the stable relationship between debt and economic activity. The debt ratio measured in this way fluctuated within a very narrow range, with no evident trend either up or down. By contrast, since 1980 outstanding debt has risen by one-third compared to the size of the economy.[12] But as Table 2 shows, a rising ratio of debt to income is not new for private borrowers. The outstanding debt of unincorporated businesses has risen, relative to the size of the economy, in every decade since World War II. So has that of households. Corporate debt has risen relative to gross national product in each postwar decade except the 1970s. For each of these

Figure 4

Outstanding Debt of U.S. Nonfinancial Borrowers, 1953 – 1989



Source: Board Of Governors of the Federal Reserve System

TABLE 2

DEBT RATIOS FOR PRIVATE-SECTOR BORROWERS, 1928-1989

	Nonfarm Nonfinancial Business Corporations	Other Nonfarm Nonfinancial Businesses	Households
1928	.45	.34	.24
1945	.20	.06	.13
1950	.23	.07	.24
1960	.30	.09	.43
1970	.34	.14	.47
1980	.29	.16	.50
1989	.39	.24	.64

Note: Values shown are ratios of yearend debt outstanding to fourth-quarter gross national product (at seasonally adjusted annual rates).

Source: U.S. Department of Commerce, and Board of Governors of the Federal Reserve System.

three borrowing sectors, therefore, it is difficult to look at Figure 4 and identify the 1980s as a clear departure from prior postwar experience.

Instead, what stands out in this regard is primarily the extraordinary behavior of the federal government's debt ratio. Not only in the postwar period but in the entire history of the United States, back to 1789, the only sustained increases in the outstanding federal debt compared to the size of the economy took place during major wars and during the depression of the 1930s (when the economy itself was shrinking). With the huge budget deficit that the government ran throughout the 1980s, however -- notwithstanding the absence of either war or depression -- the federal debt ratio increased in every year from 1981 through 1989. This extraordinary fiscal situation has probably affected the U.S. economy in a variety of ways, but increasing the likelihood of financial crisis is presumably not one of them. Even after the increase of the 1980s, the federal debt ratio is still just back to where it was (on the way down, after World War II) in 1962, and to date no one has voiced serious concern over the government's ability to meet its obligations.

Taggart (1985) has pointed out that, among private borrowers, sector-aggregate debt ratios in the 1980s have reached record levels for households but not for businesses. Precise comparisons to the prewar (and predepression) experience are difficult to draw for several reasons, of which the most immediate in this context is that a greater fraction of the nation's business activity is now conducted via corporations than was the case sixty years ago. As Table 2 shows, however, the combined debt of corporations and unincorporated businesses is still well below the relative level that prevailed during the 1920s.

Just what to make of these comparisons is unclear. Summers' interpretation of the 1980s as mostly a continuation of prior postwar trends is, in the end, unreassuring because of the lack of any benchmark for judging how high is up. Carried to its logical conclusion, this argument implies that no level of debt compared to income would be worrisome as long as borrowers got there by increasing their indebtedness along a continuation of their respective postwar trend lines. Nor is Taggart's comparison to the 1920s ultimately persuasive in light of the debt default experience of the 1930s.

Perspectives on Firm Behavior. In contrast to these arguments on the basis of aggregate data, Jensen has developed a series of arguments about the behavior of individual firms, all to the effect that the nature of the transactions by which U.S. corporations have substituted debt for equity in the 1980s is such as to minimize, or even alleviate altogether, the risks that have normally been attendant on high indebtedness in the past.[13]

First, Jensen has argued that the "value" created for investors in leveraged buy-outs and other forms of corporate acquisitions -- value that is apparent in the typically large premium paid over the previously prevailing market price of the acquired firm's stock -- is a reflection of prospective gains in operating efficiency. In the case of leveraged buy-outs in particular, Jensen has argued that these gains in efficiency are due to the replacement of an inferior organizational form of management, the conventional large (and often diversified) corporate structure, with the superior organizational form represented by the "LBO association." Further, even apart from changes in organizational form, Jensen's "free cash flow" theory of corporate behavior holds that a higher debt level increases managers' incentive to achieve operating efficiencies: "Debt creation, without retention of proceeds of the issue, enables managers to bond their promise to pay out future

cash flows. . . the exchange of debt for stock helps managers overcome the normal organizational resistance to retrenchment that the payout of free cash flow often requires. The threat of failure to make debt-service payments serves as a strong motivating force to make such organizations more efficient."[14]

While this first argument implies that increased earnings are likely to be forthcoming to support firms' newly increased leverage, Jensen has also argued that the highly levered capital structure itself reduces creditors' incentive to force liquidation of the firm in the event that the anticipated efficiency gains and consequent higher earnings do not materialize. The heart of this second argument is that higher leverage also increases the value at risk in any bankruptcy proceeding, which in turn ". . . provides larger incentives to bring about private reorganization outside of the courts."[15] Hence even if the firm fails to achieve greater efficiency and faster earnings growth, and therefore cannot meet the increased debt service payments promised, the outcome is unlikely to be a traditional default and bankruptcy of the kind that in the past has resulted in workers laid off, orders to suppliers cancelled, and losses recorded on creditors' balance sheets.

Third, Jensen has also argued that several recent advances in financing technology have further reduced the likelihood of a bankruptcy that would result in any of these undesired outcomes. One example is the use of "strip financing," in which each participant in a reorganization purchases an identical set of (inseparable) claims against the firm, ranging from secured debt to senior unsecured debt to junior unsecured debt to equity. The object of strip financing, from this perspective, is to make the creditors senior to any possible dividing line identical to those junior to it, and thereby preclude the emergence of an adversarial situation that could lead to one

party's putting the firm into bankruptcy. Examples of other financial innovations that reduce the ordinary risks attendant on high debt service ratios are the purchase of interest rate "caps," which limit the potential increase in payments that a firm is obligated to make, and "swaps," which in effect convert nominally floating rate debt into fixed rate debt.

Roach (1989) has advanced an additional argument that further buttresses Jensen's confidence that the corporations that have greatly increased their leverage in the 1980s have, for the most part, done so under specific circumstances that do not represent greater financial fragility. According to Roach's data, firms involved in leveraged buy-outs have been disproportionately engaged in lines of business typically subject to smaller than average fluctuation of earnings over the course of ordinary business cycles. Food and tobacco companies, for example, accounted for more than 20% of all LBO transactions effected during 1978-88 (measured by dollar size), and companies in retail trade accounted for nearly another 19%. By contrast, such cyclically sensitive industries as mining, construction, and manufacturing of most durable goods have experienced relatively less LBO activity. As a result, the exposure of the newly leveraged firms to potential inability to meet their debt service payments in the event of recession should be smaller than if these firms had been uniformly distributed throughout the U.S. corporate business sector.

Once again, it is difficult to know what confidence to place in these arguments. As of the time of writing, it appears as if new patterns of LBO activity are beginning to deviate from the concentration on noncyclical industries emphasized by Roach.[16] (The two most recent large transactions both involve airlines.) Because Jensen's arguments are strictly forward-looking, however, they are much more difficult to evaluate.

International Comparisons. Finally, yet another another line of argument downplaying the significance of the great increase in business indebtedness in the 1980s has emphasized the fact that, even today, most U.S. corporations remain less highly leveraged than their European or Japanese counterparts.[17] If businesses elsewhere can sustain much greater debt burdens, the reasoning goes, why cannot ours?

Simple comparisons between corporate capital structures here and abroad fail to take into account differences in the institutional, legal, and philosophical environment that are potentially of great significance in this context. Foreign financial markets and financial institutions are typically structured very differently than those in the United States. Ownership of corporate debt and equity securities is typically more highly concentrated than it is here, and -- unlike in the United States -- major lenders are also often major equity holders in the businesses to which they lend. As a result, the entire relationship between the financial sector and nonfinancial industry has a sharply different character.

At the same time, foreign attitudes toward competition versus cooperation (or even cartelization) within industry have traditionally differed from attitudes in the United States. So have attitudes toward the relationship between the private sector as a whole and the government, including in particular the willingness of both financial institutions and nonfinancial firms to accede to various forms of governmental guidance. In some cases, a close corollary of this willingness has been a different set of presumptions about the government's readiness to intervene, if necessary, to rescue distressed private firms.

No one knows just how important any or all of these differences have been in accounting for the historically higher leverage of European and Japanese

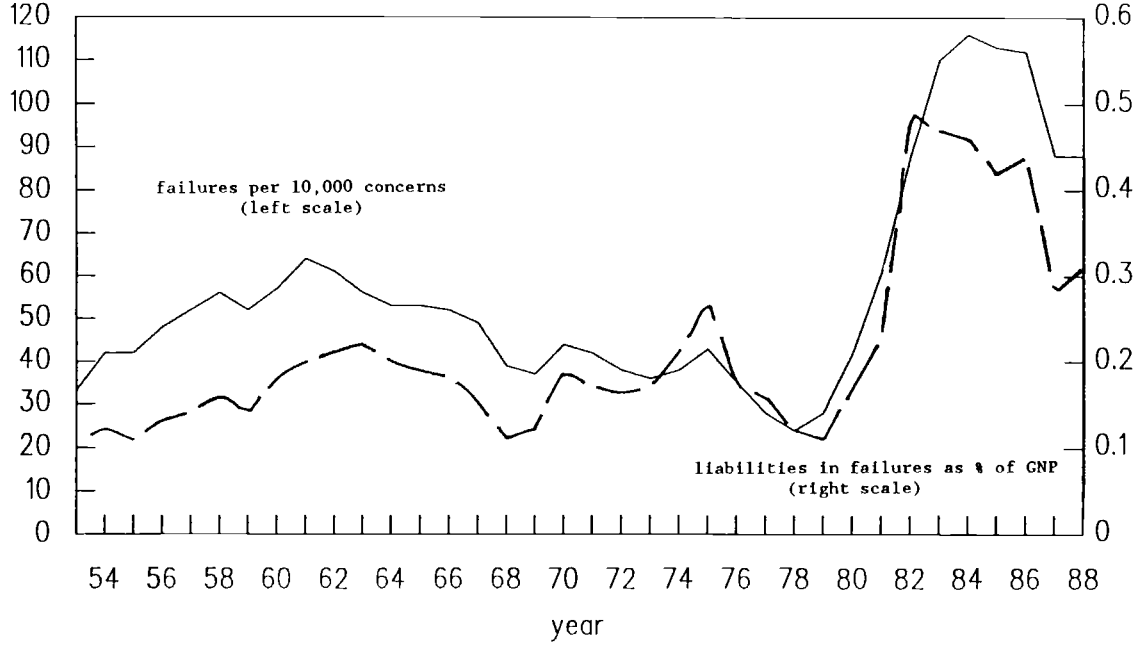
firms. Much systematic research needs to be done on such questions. The findings of that research may indicate, for example, that specific changes in U.S. legal and institutional structures would be useful, in that they would then permit corporations to adopt, with safely, debt burdens more nearly comparable to those abroad. In the absence of such changes, however -- indeed, in the absence even of knowledge about just which differences between institutions here and abroad are most important in this regard -- the simple fact that U.S. corporations' debt burdens have not yet risen as high as those of foreign firms is also not reassuring.

Bankruptcies and Defaults in the 1980s. Given the uncertainty surrounding each of these disparate sets of arguments, the actual record of bankruptcy and default by U.S. businesses in the 1980s may be instructive. As Figure 5 shows, this experience has already been beyond all prior comparable experience since World War II, despite the sustained economic expansion that began in 1983. Bankruptcies and defaults have usually increased during and immediately after business recessions, but in prior postwar experience both had then fallen back to pre-recession levels not long after the recession ended. After the 1981-82 recession, however, both bankruptcies and defaults continued to rise for four years during the ensuing expansion, and even by 1988 the bankruptcy and default rates remained far above any previous postwar level.[18] (By contrast, neither the level nor the persistence of delinquencies on consumer loans was at all out of the ordinary, either during or following the 1981-82 recession.)

The fact that not only the business failure rate but the default rate too has been extraordinary in the 1980s is of particular significance. Popular discussion of the increase in business bankruptcies has sometimes suggested -- erroneously -- that this phenomenon is merely the reflection of an especially fertile climate for new business start-ups created by tax reduction and

Figure 5

Bankruptcy Rates and Default Rates
1953–1988



Source: Dun and Bradstreet. Coverage does not include all industry sectors.

deregulation since 1980. Since new start-ups are much more likely to fail than going concerns, any period in which start-ups increase rapidly will also be a period in which failures increase rapidly, and hence the higher failure rate in the 1980s is supposedly a healthy sign rather than a danger signal. If all that were true, however, the failure rate would be high but not the default rate. New start-ups typically do not have large amounts of liabilities. (Moreover, popular impressions notwithstanding, it is also not true that the pace of business start-ups was unusually rapid in the 1980s. The number of new businesses incorporated each year rose at just 2.7% per annum on average during 1980-89, versus 6.0% per annum during 1950-80.[19])

The specific default experience of the high-yield unsecured debt ("junk bonds") typically issued in the course of leveraged buy-outs and other corporate acquisitions has in particular been subject to substantial debate. Most researchers have agreed that the overall default rate on such securities has been modest.[20] By contrast, Asquith et al. (1989) have shown that this finding hinges on the great increase in the volume of such securities issued in recent years, together with the tendency for most defaults to occur only several years after the time of issue. Although the default rate for high-yield bonds that have been outstanding for several years or more is high, the "universe" of bonds outstanding at any point in time consists disproportionately of bonds issued only recently, and therefore exhibits only the familiar modest default rate <u>overall</u>.

Table 3, reproduced from Asquith et al., shows that the cumulative default rate, measured for bonds issued <u>in each year</u> rises from only 3-8% after three years to 25-33% after ten years. Nevertheless, with $31 billion of junk bonds issued in 1986 and $13 billion per annum on average in 1984-85, versus only $1 billion per annum on average during 1977-82, the overall default rate for all

TABLE 3

AGED DEFAULTS FOR HIGH YIELD BONDS GROUPED BY YEAR OF ISSUE

Issue Year	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	Total
Panel A: % of Par Amount Defaulted in nth Year After Issue													
1977	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.71	3.63	19.27	3.30	0.00[1]	33.92
1978	0.00	8.32	0.00	1.39	0.00	7.91	4.85	3.12	5.55	1.39	1.73[1]	-	34.26
1979	0.00	0.00	5.54	1.11	2.38	6.73	1.98	0.00	5.78	1.19[1]	-	-	24.70
1980	0.00	0.57	2.45	0.00	0.00	13.90	6.30	1.88	2.45[1]	-	-	-	27.56
1981	0.00	6.05	0.00	8.06	6.85	0.00	0.00	0.00[1]	-	-	-	-	20.97
1982	1.00	2.41	1.61	11.49	0.00	9.44	0.00[1]	-	-	-	-	-	25.94
1983	0.00	0.00	6.08	7.83	4.80	0.50[1]	-	-	-	-	-	-	19.21
1984	2.29	1.99	2.03	3.06	0.00[1]	-	-	-	-	-	-	-	9.38
1985	0.00	0.80	2.28	0.45[1]	-	-	-	-	-	-	-	-	3.53
1986	2.73	3.84	1.57[1]	-	-	-	-	-	-	-	-	-	8.14
Panel B: Cumulated % of Par Amount Defaulted for x Years After Issue													
1977	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.71	11.34	30.62	33.92	33.92[1]	33.92
1978	0.00	8.32	8.32	9.71	9.71	17.61	22.47	25.59	31.14	32.52	34.26[1]	-	34.26
1979	0.00	0.00	5.54	6.65	9.03	15.76	17.74	17.74	23.52	24.70[1]	-	-	24.70
1980	0.00	0.57	3.03	3.03	3.03	16.93	23.22	25.10	27.56[1]	-	-	-	27.56
1981	0.00	6.05	6.05	14.11	20.97	20.97	20.97	20.97[1]	-	-	-	-	20.97
1982	1.00	3.41	5.02	16.51	16.51	25.95	25.94[1]	-	-	-	-	-	25.94
1983	0.00	0.00	6.08	13.91	18.71	19.21[1]	-	-	-	-	-	-	19.21
1984	2.29	4.28	6.32	9.38	9.38[1]	-	-	-	-	-	-	-	9.38
1985	0.00	0.80	3.08	3.53[1]	-	-	-	-	-	-	-	-	3.53
1986	2.73	6.57	8.14[1]	-	-	-	-	-	-	-	-	-	8.14

[1] May be incomplete, i.e. entire sample may not have been outstanding for x years.

TABLE 3 (Continued)

AGED DEFAULTS FOR HIGH YIELD BONDS GROUPED BY YEAR OF ISSUE

Note: In this table an nth year default is defined as a default within n x 365 days of the issue date. High yield bonds are all bonds rated below investment grade at issue date by Moody's and Standard & Poor's. Defaults are defined as a declaration of default by the bond's trustee, filing of bankruptcy by the firm or assignment of a D rating by S & P for a missed coupon payment.

Source: Asquith et al. (1989).

bonds issued during 1977-86 remains just 8%.[21] No doubt the patterns shown in Table 3 reflect not just the passage of time per se but also the fact that firms issuing bonds since 1983 have not had to face the burden of meeting debt service payments during a recession. At least until the next recession occurs, however, separating out these two factors will remain difficult if not impossible.

IV. Focus on the Banks

The evidence and arguments presented in Sections II and III bear entirely on the question of whether, and under what circumstances, the borrowers that have taken on greatly enlarged debt service burdens in the 1980s may be unable to meet their commitments. In some contexts -- for example, setting the right price on junk bond portfolios, or evaluating the prospects for specific borrowers or even specific industries -- this is all that matters. From the broader perspective of assessing the likelihood of financial crisis, however, the ability of lenders to absorb portfolio losses is also crucial. Given the history of financial crises, the strength of lenders that also function as financial intermediaries is of particular importance in this regard.

Financial crises in the past have invariably involved not just debt defaults by nonfinancial borrowers but either the threat or the actuality of a rupture of the financial system. Indeed, as long as financial intermediaries continue both to create deposits and to extend credit, the economy as a whole is likely to remain insulated from a cumulative default experience capable of sharply curtailing nonfinancial economic activity. After all, that is why the "lender of last resort" policies of central banks (and, occasionally, other governmental agencies) usually focus on avoiding the failure of financial institutions, even though their underlying public policy objective is far broader. Although the solvency of the U.S. financial intermediary system has already received enormous attention elsewhere -- banks primarily in the context of loans to developing countries, thrift institutions in the context of the recent plague of insolvencies and the subsequent multi-hundred billion dollar bail-out -- the issue is important enough to warrant at least some attention here as well.

Table 4, adapted from Brumbough et al. (1989), shows how the $2.9 trillion of assets -- and hence deposits -- held as of September 1988 at all U.S. commercial banks of size greater than $50 million was distributed among banks according to each bank's ratio of risk-adjusted capital to total assets.[22] Almost $1 trillion of this total was held at banks with capital-asset ratios below 6%, and in some cases far below, even with all bank assets counted at full book value.

What makes this situation either more or less likely to lead to a potential problem, depending on one's perspective, is the extreme concentration of this $1 trillion of assets among the nation's largest banks. Individual banks' yearend data for fiscal years ending in 1988 showed a total of $833 million of assets -- well over a quarter of the $2.9 trillion shown in Table 4 -- held by the largest 15 banks. Again with all bank assets counted at full book value, these banks had capital-asset ratios ranging from 1.49% (NCNB of Texas) to 6.89% (Morgan Guaranty Trust Co.). The average capital-asset ratio for all 15 banks, weighted by assets, was 4.34%. But merely assuming a reserve for LDC loan losses equal to 50% of each bank's exposure reduced the average capital-asset ratio for the group to 3.17%, and for the more exposed banks the erosion consequent on allowing a 50% reserve against LDC loans was even greater. For Manufacturers Hanover, for example, allowing this reserve reduced the capital-asset ratio from 5.31% to 1.44%. Doing so for Bank of America reduced its ratio from 3.71% to 1.48%.[23]

Further, these same banks are also among the most heavily committed to financing leveraged buy-outs. As of the most recent available data, 12 of the nation's 15 largest banks each had more than $1 billion in LBO exposure, including loans already outstanding plus unfunded commitments. Total exposure among these 12 amounted to $37 billion -- more than their combined total

TABLE 4

DISTRIBUTION OF BANK ASSETS BY CAPITAL-ASSET RATIO

Ratio of Risk-adjusted capital to Total Assets	Number of Banks	Assets
Negative	28	$ 22.5 b
0-3%	48	43.4
3-6%	150	926.0
6% +	5,094	1,894.5
Total	5,320	$2,886.4

Notes: Asset figures are in billions of dollars.

Data are for September 1988.

Source: Brumbaugh et al. (1989).

capital, even including all LDC loans at full book value. Manufacturers Hanover, for example, which had $3.3 billion of capital as reported, or only $900 million after allowing a 50% reserve against LDC loans, had $5.1 billion in LBO exposure including $3.5 billion of loans already outstanding. Bankers Trust, which had $2.6 billion of reported capital, or $1.5 billion after a 50% reserve against LDC loans, had $5.0 billion of total LBO exposure including $3.6 billion in loans already outstanding.[24]

In sum, the largest U.S. banks' holdings of debt issued in the course of leveraged buy-outs alone -- not to mention other corporate reorganizations also involving the substitution of debt for equity capitalization -- already bulks large compared to these banks' thin margins of capital. Because other lenders (life insurance companies, for example) have also participated heavily in financing corporate reorganizations, while most developing countries have been able to borrow only from banks, banks' total LBO exposure remains well below their total LDC exposure.[25] Nevertheless, exposure to risk via LBO debt and other high-leverage corporate situations has grown to a magnitude that also represents a potential problem in the event of any systemic default experience. Moreover, the circumstances under which large numbers of highly levered U.S. corporations would be unable to meet their obligations -- a severe business recession, for example -- overlap considerably with circumstances under which many developing countries would find servicing their debts even more problematic than is already the case.

By contrast, debt securities issued in corporate reorganizations are apparently less of a factor in the current troubled situation of U.S. thrift institutions. The Garn-St. Germain Depository Institutions Act of 1982 authorized federally chartered thrift institutions to hold up to 11% of their assets in junk bonds, and state-chartered institutions have faced more generous

limitations in some cases. California, for example, in principle imposes a 15% limit (although one large California institution had 29% of its consolidated assets in junk bonds as of March 1988). Nevertheless, as of September 1988 only 161 of the more than 3,000 FSLIC-insured thrift institutions owned any junk bonds at all, and among those that did, in most cases their holdings were well within these limits.

Thrifts that become insolvent in 1987, for example, held only .2% of their combined total assets in junk bonds, and only 1.9% in commercial loans of all kinds.[26] As of September 1988, all thrift institutions combined held only $13 billion of junk bonds, or about 5% of the universe of junk bonds outstanding. These holdings were highly concentrated, with 76% of the thrift industry total held at just 10 institutions, and 91% at 25 institutions. Although this concentration patter raises questions about the few institutions that do have junk bonds holdings, a recent GAO inspection found no apparently greater risk of insolvency at these institutions on that account.[27] Indeed, some of the ten thrift institutions with the largest junk bond holdings have been unusually profitable.

V. Summary of Conclusions

The evidence and arguments reviewed in this paper support several specific conclusions. First, financial crises have historically had a major role in large fluctuations in business activity. A financial crisis has occurred either just prior to, or at the inception of, each of the half dozen or so most severe recorded declines in U.S. economic activity. Before World War II financial crises occurred in conjunction with most other business downturns as well.

Second, the proclivity of private borrowers to take on debt in the 1980s has been extraordinary by postwar standards. Among business borrowers, including especially corporations, much of the proceeds of this surge in debt issuance has gone to pay down equity (either the borrower's or another company's) rather than to put in place new earning assets. As a result, interest payments have risen dramatically compared to either earnings or cash flow. The corporate business sector's debt service burden, relative to either earnings or cash flow, rose to record highs in the early 1980s and has remained at record levels despite sharp declines in nominal interest rates and a sustained expansion of business profits.

Although there are arguments both for and against the view that this increase in business leverage raises the prospective threat of widespread default in the event of a generalized decline in earnings, as would presumably occur during a major recession, a third conclusion that is clear from the record to date is that the rate at which U.S. business have gone bankrupt and defaulted on their liabilities in the 1980s is already far out of line with any prior experience since the 1930s. The business failure rate not only rose to a postwar record level during the 1981-82 recession but -- in contradiction to prior cyclical patterns -- continued to rise through the first four years of

the ensuing recovery. The volume of defaulted liabilities, measured relative to the size of the economy, behaved in a parallel way (thereby contradicting the notion that the businesses that failed were primarily new start-ups, of small enough size not to matter much from the perspective of systemic risk).

Fourth, the largest U.S. banks' exposure to debt issued in the course of leveraged buy-outs or other transactions substituting debt for equity capitalization now exceeds their risk-adjusted capital, even with all bank assets (including loans to developing countries) counted at book value. Although this exposure is not (yet) as large as that due to banks' LDC loans, the two sets of risks are not independent.

The implications of these developments for public policy in the United States are, at least potentially, profound. If these trends of the 1980s together comprise an increase in the economy's financial fragility, they increase the likelihood that the government will have to act in its capacity as lender of last resort, and also the likely magnitude of lender-of-last-resort action should such be necessary. The responsibility for such actions has been decentralized since the 1930s, however, and some of the responsible governmental agencies are themselves less secure than used to be the case. For example, the gross insufficiency of the FSLIC's resources has already necessitated a multi-hundred billion dollar bail-out of insolvent and potentially insolvent thrift institutions, to be financed in large part by new federal government borrowing. And in 1988 the FDIC experienced a loss -- in other words, had to draw down its capital -- for the first time since its inception in 1934. Responding to a renewed insolvency problem in the thrift industry, or, even more so, to a proportionately equivalent problem in the commercial banking system, would therefore be extremely challenging.

At the same time, the Federal Reserve system also retains some responsibility to act in a lender-of-last-resort capacity. Indeed, the basic rationale for the System's creation, stated clearly in the 1913 Federal Reserve Act, was "to provide an elastic currency" -- precisely so as to avoid financial crises. Should the exercise of this responsibility become necessary, doing so in a fashion consistent with other Federal Reserve objectives, like maintaining price stability, will also be challenging to say the least.

Footnotes

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1. The best general reference is Kindleberger (1978). Sprague (1910) and Friedman and Schwartz (1963) provide useful chronologies for the United States. Galbraith's (1954) account of the 1929 stock market crash and its aftermath is a jewel.

2. See, for example, Gibbon's (1776) discussion of financial developments in the later Roman period.

3. Minsky (1963), p. 101.

4. The two exceptions were the recessions beginning in 1920 and 1937. See the useful tables in Schwert (1989), pp. 102, 105.

5. See Temin (1969).

6. Minsky (1963), p. 102.

7. See Minsky (1963, 1964, 1972, 1977). The rationale motivating the behavioral changes that drive the "financial instability hypothesis" is not fully specified in Minsky's work; see Friedman and Laibson (1989) for one possible explicit rendering.

8. See, for example, Friedman (1986, 1988) and Kaufman (1986a, 1986b).

9. Moreover, the additional financial assets taken on by households included not only equities but large amounts of deposits, government securities, and other credit market debt instruments.

10. Yearend values are taken directly from the Federal Reserve System's Flow-of-Funds Accounts. Values for other dates are based on interpolation or extrapolation of the corporate borrowing data in the Flow-of-Funds Accounts, in conjunction with a simple equation that relates the Standard & Poor's stock price index to the Flow-of-Funds estimate of the market value of equity for the entire nonfarm nonfinancial corporate business sector.

11. See Friedman (1986) for a brief examination of the Federal Reserve's 1983 Survey of Consumer Finances from this perspective.

12. The mean debt ratio during 1953-80 was $135.70 of debt for every dollar of income, with standard deviation (based on annual data) of only $2.90. At yearend 1980 the ratio was $137.10. At yearend 1989 it was $183.60.

13. See, for example, Jensen (1984, 1986, 1988, 1989a, 1989b).

14. Jensen (1988), pp. 29-30; emphasis in original.

15. Jensen (1989a), p. 413.

16. Fox (1990) has shown that firms undergoing leveraged buy-outs before around 1986 differed in this and other respects from those that have done so since then.

17. As French and Poterba (1989) have shown, however, because of the great increase in Japanese equity prices in the 1980s, since 1986 the market-value debt-equity ratio of the average corporation has been lower in Japan than in the United States.

18. The data shown are the number of bankruptcies per 10,000 concerns, and the dollar volume of liabilities in business failures expressed as a percentage of gross national product. Data are from Dun and Bradstreet. Values plotted for 1984-88 are adjusted (by the author) for a series break after 1983.

19. Data are from Dun and Bradstreet.

20. See, for example, Altman and Nammacher (1985) and subsequent annual issues.

21. See Asquith et al. (1989), Table 2.

22. See Brumbough et al. (1989), Table 5. "Risk-adjusted capital" is defined as equity plus perpetual preferred stock plus subordinated debt and limited preferred stock, minus investments in unconsolidated subsidiaries.

23. Data described here are from Brumbaugh et al. (1989), Table 6.

24. Data described here are from Quint (1989).

25. See Paul Krugman's chapter in this volume.

26. See Brumbaugh et al. (1989), Table 13.

27. See General Accounting Office (1989).

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