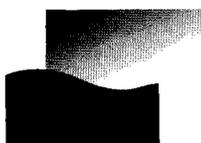


Recent trends in corporate leverage

Paula R. Worthington



Many analysts have voiced concerns about the indebtedness of U.S. corporations during the last several years.

These analysts believed that the debt buildup of the 1980s would leave firms in precarious financial condition if and when the next cyclical downturn arrived; higher debt burdens would prove difficult to manage when revenues and cash flows fell in a recession. Some of these concerns have indeed been borne out in the most recent cycle, as many firms found their debt servicing needs remained high while funds available to meet those needs tapered off. Analysts have also argued that firms have recently taken great strides in reducing their debt burdens and “restructuring their balance sheets.” In this article, I examine some aggregate data for the U.S. nonfinancial corporate sector and consider several aspects of the changes in corporate debt burdens in recent years. In particular, after presenting some evidence of the debt buildup of the 1980s and its subsequent slowdown, I focus on the balance sheet restructuring that began in 1990 and continues to the present.

The article’s findings are briefly stated. I find that total debt growth has indeed slowed, though its short and long term components have moved in opposite directions in recent quarters. Various debt to asset and debt to income ratios have fallen noticeably in recent quarters, though typically they have failed to retrace much of their buildup during the 1980s. Flow measures of indebtedness, such as interest expense to cash flow ratios, have shown much larger decreases, and I find that the principal factor explaining these decreases is the drop in interest rates expe-

rienced in both the short and long term ends of the rate structure. Cash flow growth and debt level reduction, by comparison, have contributed only a modest amount to the observed decrease in these ratios. This suggests that firms have indeed experienced a decrease in their debt burdens, but that this is due more to the effects of monetary policy than to explicit restructuring efforts on the part of firms themselves. Furthermore, this analysis suggests that debt burdens remain historically high, so that future interest rate increases may return many firms to situations in which cash flow may be inadequate to service outstanding debt. The consequences of the 1980s debt buildup will remain an economic force well into the decade of the 1990s.

The rest of this article is organized as follows. In the following section, I define and describe the measures of leverage used in this article; Box 1 describes in more detail the data sources used. The article’s third section documents the debt buildup of the 1980s and its recent slowdown using simple figures and growth rates; I also briefly discuss the notion of “optimal capital structure” in that section. The fourth section looks at the balance sheet restructuring process in some detail and presents the main results of the article. The fifth section concludes.

Measures of indebtedness

Numerous financial ratios may be constructed to develop a sense of the extent of indebtedness in the U.S. nonfinancial corporate sector.

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Data sources and definitions

Most of the data used in this article are taken from the *Flow of Funds (Flows)* data collected by the Federal Reserve Board (Board); exceptions are noted in the text. *Flows* data have been published by the Board on a regular basis since 1947. The data are intended to describe the financial activities of the aggregate U.S. economy and its constituent sectors and to permit matching to income and product data summarizing real resource flows in the economy. The Board's publication, *Introduction to Flow of Funds*, contains good background information on this data source.

This article uses data pertaining only to the nonfinancial, nonfarm corporate sector, and all data are in nominal dollars. I use data from 1959:Q1 through 1992:Q3, the last quarter for which complete data are available. I refer to 1992:Q3 as the current quarter throughout the article. Two of the series used in the article, trade debt and trade credit, experienced changes in reporting methods and variable definitions over the studied time period, so in the following paragraphs I describe the changes and how I adjusted the series to ensure comparability over time.

Trade debt

In the fourth quarter of 1974, the *Flows* series labelled "trade debt" displays a huge (32.8 percent) drop from its 1974:Q3 level. This decline reflects a change in the source data used by the Board to construct the trade debt series. To get a consistent series, then, I must adjust the data for 1974:Q3 and earlier quarters to match the later period definitions and sources.

Through 1974:Q3, the Board relied on the Securities and Exchange Commission's (SEC) data on working capital of nonfinancial corporations for the "notes and accounts payable" component of trade debt.¹ From 1974:Q4 forward, the Board has used an alternative series, called "payables," developed by the Federal Trade Commission (FTC) and the Board. The payables series, both old and new, is not part of the *Flows* data and instead is available (through 1986 only) in the Board's *Annual Statistical Digest*. These two alternative payables series can be easily spliced at 1974:Q4, because both are available for that quarter only (Board of Governors, July 1978). The series are quite different in levels: the old series reports a value of \$402.3 billion, while the new one reports one of \$272.3 billion. However, since I lack data for the other components of the trade debt series, I cannot simply splice the payables series and then adjust the trade debt series in turn. Instead, I assume that between 1974:Q3 and 1974:Q4 the percentage change in trade debt

equals the percentage change in payables, where I use the adjusted payables data. This gives me an adjusted level of trade debt for 1974:Q3. For 1972:Q2 and earlier quarters, I assume that the percentage change in the unadjusted trade debt series equals the percentage change in the adjusted trade debt series. These two assumptions permit me to compute an adjusted trade debt series for the quarters before 1974:Q4.

Trade credit

The *Flows* series labeled "trade credit" exhibits similar behavior to that of trade debt: a break in the series occurs in 1974:Q4 as the Board switches from one data source to another. Prior to 1974:Q4, the "accounts receivable" component of trade credit was derived from the SEC data mentioned above. From 1974:Q4 onwards, that component was derived from series prepared by the Board and the FTC. Like the payables series discussed above, the receivables series can be easily spliced at 1974:Q4, the quarter for which both series are available; in addition, the receivables series is not part of the *Flows* data but is published (through 1986) in the *Annual Statistical Digest*. To compute an adjusted trade credit series, I need additional data on consumer credit because trade credit is defined as the difference between receivables and consumer credit (see Footnote 1 of this Box). Thus, to obtain an adjusted series for 1984:Q3 and earlier, I proceed as follows. First, I use the published (unadjusted) *Flows* data to compute an unadjusted receivables series as the sum of trade credit and consumer credit. Next, I adjust the receivables series by assuming that the percentage change in receivables between any two quarters is the same for both the adjusted and the unadjusted data. Finally, I compute an adjusted trade credit series for 1974:Q3 and earlier by setting adjusted trade credit equal to the difference between the adjusted receivables series and the original (unadjusted) consumer credit series. An alternative method more comparable to the one used for trade debt yields very similar results.²

¹For a discussion of the components of all *Flows* series, see Board of Governors (1971).

²Under the alternative method, I compute adjusted receivables for 1974:Q3 only by assuming that the percentage changes in adjusted and unadjusted receivables between 1974:Q3 and 1974:Q4 are equal. I then compute adjusted trade credit for 1974:Q3 as unadjusted trade credit plus adjusted receivables less unadjusted receivables. For 1974:Q2 and earlier, I assume that the percentage changes in the adjusted and unadjusted trade credit services are equal.

I consider three types of ratios in this article. First, I examine a short term assets to liabilities ratio. Next, I consider a debt to income ratio, and finally I look at ratios of interest payments to cash flow. The remainder of this subsection defines and describes each ratio in turn (Box 1 contains additional information on data sources and definitions).

Ratios of assets to liabilities measure the solvency and/or liquidity of a firm or sector. I use the ratio of short term liabilities to short term assets, which is just the reciprocal of the current ratio.¹ This ratio is a good measure of liquidity since short term assets are those that could be quickly used to meet the short term liabilities faced by the sector.

The second ratio I examine is the ratio of total debt outstanding to the flow of gross domestic product for the nonfinancial sector (NFGDP); similar ratios are commonly used in discussions of government and household sector indebtedness [Friedman (1982) and Eugeni (1993)]. Shoven and Waldfoegel (1990) refer to such measures as “hybrid” financial ratios, because they compare stocks to flows. Such ratios offer a rule of thumb measure of indebtedness by comparing a sector’s flow of total income to its total debt; the ratio essentially measures how quickly the sector’s underlying assets would generate the income needed to repay the debt.

Finally, I examine the ratio of interest payments to cash flow, a liquidity measure which compares the current flow of debt servicing obligations with the current flow of cash available to meet those obligations. The denominator of the ratio, cash flow, is defined as the sum of before tax profits, depreciation, and interest payments, while the numerator is simply interest payments.² Appropriate interest payments measures are not directly available, so I construct proxies as follows. Short term interest payments are computed as the product of the six month commercial paper rate and short term debt outstanding; long term interest payments are computed as the product of the corporate AAA bond rate and long term debt outstanding; and total interest payments are computed as the sum of short and long term payments. These proxies assume that firms can and do “roll over” their debt, both short and long term, each time period (quarter or year). This implies that when rates are rising, these proxies may overstate the increase in the debt servicing burden, since firms will not choose to refinance existing debt at the newly higher rates. On the

other hand, when rates are falling, these proxies may overstate the decrease in the burden, since firms cannot refinance all of their debt immediately following a rate decline. These proxies also ignore the fact that not all nonfinancial corporations have the same credit rating, so that the rates paid for a given maturity issue will differ across firms. Despite these shortcomings, these measures can provide an idea of both the level and change in debt burdens.³

The debt buildup of the 1980s and its recent slowdown

Many studies have documented the leveraging boom of the 1980s and have analyzed its sources and consequences.⁴ At year end 1980, U.S. nonfinancial corporations had a total of \$875.0 billion in total debt outstanding, while by year end 1990, they had \$2,273.4 billion, an increase of nearly 160 percent. During that same time period, the sector experienced growth of only 96 percent in nominal NFGDP. Table 1 presents the annualized growth rates for NFGDP, total debt, long term debt, and short term debt over several time periods. The Table clearly shows that total debt growth exceeded income growth over the 1980s and that both short and long term debt grew vigorously over the decade.

Financial analysts disagree on whether this increase in debt relative to NFGDP (and other measures) was “good” or “bad.” Evaluating the welfare consequences of particular capital structures requires a theory of optimal capital structure, and many theories and arguments have been proposed. Analysts tend to agree on the factors that determine the optimal capital structure but rarely agree on their relative importance. For example, corporate tax rates, expected bankruptcy costs, liquidity of asset markets, and the extent and nature of information based problems, such as adverse selection and moral hazard, will all

TABLE 1

Annualized growth rates

	NFGDP	Total debt	Long term debt	Short term debt
1980-1990	.070	.100	.093	.112
1983-1990	.066	.108	.114	.100
1984-1990	.058	.099	.112	.082

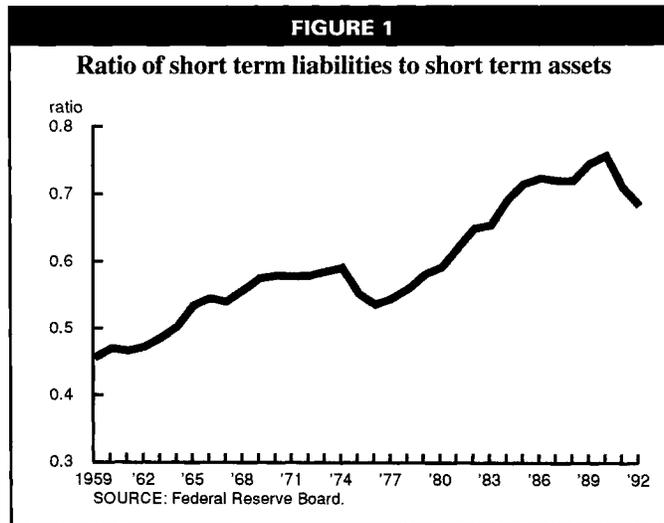
SOURCE: *Flow of Funds*, Federal Reserve System, various years.

influence firms' choices of debt and equity. A comprehensive treatment of these factors and consideration of their behavior over the 1980s is beyond the scope of this article; hence, in what follows, I remain agnostic as to the welfare consequences of increases and decreases in corporate leverage. Instead, I simply document recent trends and attempt to identify which factors have been most important in recent quarters in corporate balance sheet restructuring.

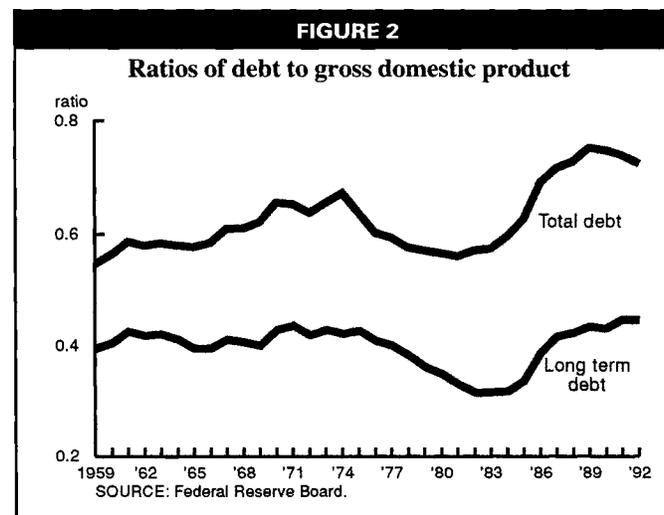
To properly evaluate whether the increased debt levels really represented increases in indebtedness, one needs to consider the ratios defined in the previous section. Figures 1 through 3 depict the patterns in three sets of ratios since 1959, and together they tell a story of substantial increases in leverage over the 1980s. For example, the ratio of short term liabilities to short term assets (STL/STA), which is shown in Figure 1, rose from .593 at the beginning of the 1980s to a peak of .760 in 1990:Q1. Since then, the ratio has fallen to .687, corresponding to a current ratio of 1.46 and bringing the ratio back to 1984 levels. The ratio's decline reflects actual reductions in current liabilities and somewhat modest growth in current assets.

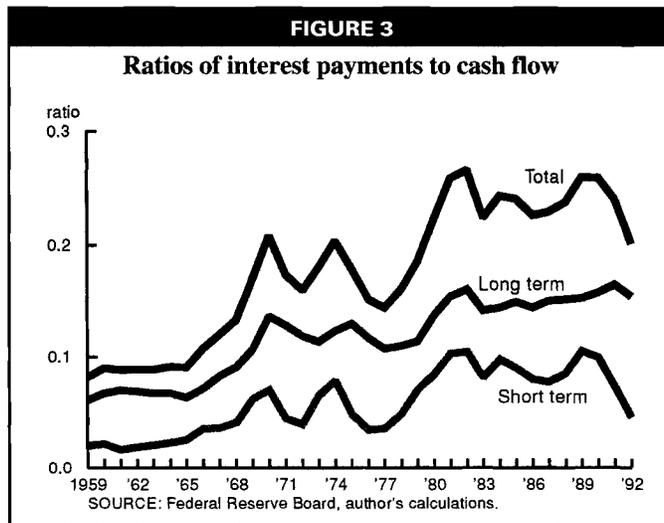
The ratio of debt outstanding to NFGDP, depicted in Figure 2, displays a pattern similar to that of the STL/STA ratio. The total debt to NFGDP ratio rose throughout the 1980s, peaking in 1991:Q1 at .751; the ratio has since fallen to .718. Much of this ratio's recent decline reflects decreases in short term debt outstanding; if only long term debt is used in the ratio's numerator, the ratio has not declined but has only leveled off, reflecting recent moves by corporations out of short term into long term debt.

Figure 3 presents the interest payments to cash flow ratios, and all three ratios tell similar stories: burdens grew in the late 1970s and early 1980s, as interest rates reached historically high levels. During the 1980s, these measures remained high by historical standards, though they varied quite a bit from year to year. Each of the ratios was higher by the



end of 1990 than it had been at the end of 1980, though the 1990 ratios were below the decade peaks of 1982. Furthermore, the most recent data indicate a continued, pronounced decline in these interest burden measures from their local peaks in late 1990 and early 1991, with the short term interest burden falling much more than the long term burden. To interpret these patterns properly, recall that the sources of the high interest burdens were quite different between the early 1980s and early 1990s. In the early 1980s, the source was high interest rates; in the early 1990s, the source was high debt levels. For example, consider the short term measure, which equalled .085 in 1980, with short term debt outstanding of \$332.3 billion and an average six month commercial paper rate of 14.5 percent. By 1990, the ratio had risen to .107, because outstanding short term debt had





increased to \$959.7 billion although the six month commercial paper rate was significantly lower, at 7.7 percent.

Balance sheet restructuring

The ratios presented in the previous section suggest that firms have begun to reverse their debt positions, with particularly noticeable decreases in debt servicing burdens and short term debt levels and ratios. A natural question, then, is when the restructuring process will be over. However, answering this question requires forecasting and understanding corporate preferences regarding optimal capital structure, both of which are beyond the scope of this article. Rather, in this section, I ask three distinct but related questions. Each question emphasizes a different perspective on the leverage issue and, as a consequence, analyzes different leverage measures.

How valuable are two more years of restructuring?

If the restructuring process continues for another two years as it has for recent quarters, what will corporate balance sheets look like? That is, exactly how much will the corporate sector have lightened its debt burden? Since different leverage measures peak in different quarters and exhibit somewhat different patterns around their peaks, I will use the recent business cycle peak date, 1990:Q3, as a common reference point.

Consider the entries in Table 2 below. For two of the ratios discussed in the previous section, STL to STA and debt to NFGDP, I compare their 1990:Q3 value to their current value, and then calculate what their value would be eight

quarters from now (1994:Q3) if they decrease at the same rate as they have since 1990:Q3.⁵ For example, consider the column labeled STL/STA. This ratio equaled .755 in 1990:Q3 and has declined to .687 in the most recent quarter. If that rate of decrease were to continue, in two years the ratio would reach .619, just above its 1981:Q3 value. Thus, in two more years, firms would have retraced much of the 1980s increase in this ratio. On the other hand, eight more quarters of debt load reduction at rates already experienced would bring the debt to NFGDP ratio only to 1987:Q4

levels. The difference between the two measures reflects the fact that firms have been exchanging short term for long term debt in recent quarters; consequently, short term leverage measures have decreased substantially, while long term and total measures have decreased only moderately if at all.

What factors have contributed to the decreased debt burden?

Figure 3 clearly indicates that debt servicing burdens have decreased since 1990; what are the sources of these decreases? This section attempts to disentangle the contributions of the three key factors that determine these burdens, namely the amount of debt outstanding, the level of interest rates, and the level of cash flow. In recent quarters, short term debt levels have fallen, while long term debt has risen, just slightly pulling up the total; interest rates have fallen, short term more than long term; and the noninterest

	STL/STA	DEBT/NFGDP
Peak value	.755	.742
Current value	.687	.718
Extrapolated value	.619	.694
Comparison date	1981:Q3	1987:Q4
Comparison value	.617	.696

¹Peak value is for 1990:Q3, and current value is for 1992:Q3.

payments components of cash flow (pretax profits and depreciation) have risen. This section presents some numbers to quantify the contribution of these factors.

Table 3 presents values for three interest payments to cash flow ratios under various assumptions about outstanding debt, cash flow, and interest rates. The top portion of the table simply reports the actual values of the three ratios in 1990:Q3 and 1992:Q3 and the change over that time period.⁶ For example, the short term measure fell from .098 to .040, for a change of .058, over this time period. Similarly, the long term measure fell from .158 to .150, and the total measure from .255 to .190.

Now consider the importance of debt level reduction in reducing these debt servicing ratios. The Table's first column reports that if debt levels are held at their current 1992:Q3 values while cash flow and interest rates are held fixed at their 1990:Q3 values, the short term debt servicing burden would have equalled .088 in 1992:Q3, instead of its actual .040. Thus, debt level changes alone explain only .010 (= .098 - .088) of the improvement in the ratio. The second column reports that, under the same assumptions of unchanged cash flow and interest rates but current debt levels, the long term debt burden would have equalled .172, compared to its actual .150 value in 1992:Q3. In this case, debt level changes have actually increased the debt servicing burden, contributing -.014 (= .158 - .172) to the ratio's decrease. The third level reports a similar calculation for the total interest payments servicing cash flow ratio.

Now turn to the joint roles of debt level reduction and cash flow growth.⁷ The Table reports that the short term ratio would have equalled .084 in 1992:Q3 if debt levels and cash flow were at their actual 1992:Q3 levels while interest rates remained at their 1990:Q3 values. Thus, debt level changes and cash flow growth accounted for only .014 of the change in the short term ratio, out of a total change of .058. It is clear that rate reduction has been responsible for most of the improvement in this short term service ratio. Similarly, debt level changes and cash flow growth together accounted for -.006 of the decrease in the long term ratio and .007 of that in the total ratio, out of total changes of .008 and .065, re-

	Short term interest payments	Long term interest payments	Total interest payments
Actual value in 1990:Q3	.098	.158	.255
Actual value in 1992:Q3	.040	.150	.190
Change from 1990:Q3 ratio ¹	.058	.008	.065
Debt levels at 1992:Q3 values, interest rates and cash flow at 1990:Q3 values	.088	.172	.260
Change from 1990:Q3 ratio ¹	.010	-.014	-.005
Debt levels and cash flow at 1992:Q3 values, interest rates at 1990:Q3 values	.084	.164	.248
Change from 1990:Q3 ratio ¹	.014	-.006	.007

¹Change is computed as the 1990:Q3 ratio minus the 1992:Q3 ratio.

spectively. Again, the importance of rate reduction is clear. Further, these numbers suggest why the previous section's exercise would be of limited interest for these debt servicing ratios. Measuring the effects of eight more quarters of reduction in debt burdens is not that interesting in this case, since most of the action has come from extensive rate reduction, especially short term, which is not likely to continue through 1994.

Table 3 suggests that corporations have not restructured much by actually reducing their debt levels. Instead, their debt burdens have become lighter because of extensive rate reductions and modest cash flow growth in the last eight quarters. Given that future sizeable rate reductions are unlikely in the present economic environment and that firms have shown little interest in outright debt level reduction, this puts the burden on cash flow growth to be the driving force behind future debt servicing burden reduction.

What impact will growth have on the debt burden?

The last part of this section presents some estimates of the quantitative impact of prospective cash flow and output growth on two measures of the debt burden. I consider the debt to NFGDP ratio and the previous section's interest payments to cash flow ratio based on total interest payments. Tables 4A and 4B present estimates of the impact of three alternative growth rates on these two debt burden measures, under alternative assumptions about the future growth of debt outstanding. All of the calculations as-

sume that short term debt growth is zero and that the only debt growth, if any, is long term.

Table 4A shows that if NFGDP grows at an annual rate of 3 percent over the next four quarters and if total debt outstanding does not change at all, then the ratio of debt to NFGDP will fall from .718 to .697 over the next year, bringing the economy nearly back to the 1987:Q4 value of that ratio. If NFGDP grows at 3 percent but long term debt outstanding also rises, for example by 1.5 percent, then the debt to NFGDP ratio will fall only to .707, near the 1988:Q2 value. Faster output growth means more progress in decreasing the debt to NFGDP ratio, while adding more debt retards such progress. The third column, in which NFGDP is assumed to grow by 7 percent and debt is unchanged, brings the ratio back only to 1986:Q3 levels. Thus, healthy output growth will act to decrease this ratio, but even the most robust case considered will bring the ratio back to 1986 levels, which were still high by historical standards (recall Figure 2).

Table 4B shows similar calculations to assess the impact of cash flow growth on the interest payments to cash flow ratio. I assume that rates are unchanged from their 1992:Q3 levels and that any growth in total debt outstanding is in long term debt, leaving short term debt unchanged. The Table shows that cash flow growth lowers the ratio and that faster cash flow growth (less debt accumulation) translates into faster debt burden reduction. However, the magnitude of the reductions is quite modest in all six cases considered; all would leave the interest payments to cash flow ratio close to its 1979 level. (Recall from Figure 3 that by 1979, debt servicing burdens were high by historical standards but would rise even further as interest rates continued to climb.) Thus, future cash flow growth is likely to have only moderate effects on debt servicing burdens. This is consistent with Table 3's numbers, which suggested that recent cash flow growth has contributed only modestly to recent decreases in debt servicing burdens.

TABLE 4A

Impact of future output growth on debt to NFGDP¹

Output growth rate	3%	5%	7%
Current value	.718 [1989:Q1]	.718 [1989:Q1]	.718 [1989:Q1]
Value in 1993:Q3			
Debt growth=0	.697 [1987:Q4]	.684 [1987:Q1]	.671 [1986:Q3]
Debt growth= one-half of output growth	.707 [1988:Q2]	.701 [1988:Q1]	.694 [1987:Q4]

¹Dates in brackets denote most recent quarter with ratio at or near that level.

Conclusions

This article has presented some evidence on the extent of financial restructuring undertaken by U.S. nonfinancial corporations in the last two to three years. Measures of the debt burden that focus on stocks of debt outstanding have declined in recent quarters, especially those that focus on short term assets and liabilities. However, "flow" measures of the debt burden have decreased much more significantly, primarily because of a benign interest rate climate. Thus, the recent decreases in corporate sector leverage should not be attributed so much to the explicit shedding of corporate debt but rather to the recent easing of monetary policy. Further, any substantial future interest rate increases may leave many firms nearly as vulnerable as they were before the recent recession. The burden of future balance sheet restructuring will likely be borne by simple economic growth: as growth

TABLE 4B

Impact of future cash flow growth on total interest payments to cash flow¹

Cash flow growth rate	3%	5%	7%
Current value	.190 [1979:Q3]	.190 [1979:Q3]	.190 [1979:Q3]
Value 1993:Q3			
Debt growth=0	.185 [1979:Q3]	.182 [1979:Q3]	.179 [1979:Q3]
Long term debt growth=one-half of cash flow growth	.187 [1979:Q3]	.186 [1979:Q3]	.184 [1979:Q3]

¹Dates in brackets denote most recent quarter with ratio at or near that level.

picks up, firms will expand output and revenues faster than debt, thus decreasing their debt loads in a relative sense. The consequences of the

1980s debt buildup will stay with the economy well into the decade of the 1990s.

FOOTNOTES

¹Short term assets are the sum of cash and equivalents, trade credit, and inventories; short term liabilities are the sum of short term debt, trade debt, and profits taxes payable.

²This cash flow measure has been used by other authors studying leverage issues; for example, see Bernanke and Campbell (1988), Bernanke, Campbell, and Whited (1990), Warshawsky (1990), Blair and Litan (1990), and Lee (1990). Alternative cash flow measures, such as after tax measures that may exclude dividends, are appropriate for studying other issues, for example, the sensitivity of fixed investment spending to movements in internal funds; see Fazzari, Hubbard, and Petersen (1988) and Morck, Shleifer, and Vishny (1990) for examples.

³If the net interest payments measure from National Income and Product Accounts is used instead of these proxies, very similar patterns emerge.

⁴For example, see the articles in Shoven and Waldfoegel (1990); Bernanke and Campbell (1988); and Bernanke, Campbell, and Whited (1990); for the view that the debt buildup was not large by historical standards, see McKenzie and Klein (1992).

⁵For reasons that will become clear in the following section, I do not examine the interest payments to cash flow ratios here.

⁶The change is reported as the 1990:Q3 value minus the 1992:Q3 value.

⁷In this section, cash flow growth denotes growth in the sum of pretax profits and depreciation.

REFERENCES

Bernanke, Ben S., and John Y. Campbell, "Is there a corporate debt crisis?," *Brookings Papers on Economic Activity*, 1988:1, pp. 83-125.

Bernanke, Ben S., John Y. Campbell, and Toni M. Whited, "U.S. corporate leverage: developments in 1987 and 1988," *Brookings Papers on Economic Activity*, 1990:1, pp. 255-278.

Blair, Margaret M., and Robert E. Litan, "Corporate leverage and leveraged buyouts in the eighties," in John B. Shoven and Joel Waldfoegel, eds., *Debt, taxes, and corporate restructuring*, Washington, D.C., Brookings, 1990.

Board of Governors of the Federal Reserve System, *Introduction to flow of funds*, June 1980.

_____, "Working capital of nonfinancial corporations," *Federal Reserve Bulletin*, July 1978.

_____, "Flow of funds accounts: data sources and derivations," preliminary draft, 1971.

Eugeni, Francesca, "Consumer debt and home equity borrowing," *Economic Perspectives*, March/April 1993, pp. 2-14.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen, "Financing constraints and

corporate investment," *Brookings Papers on Economic Activity*, 1988:1, pp. 141-195.

Friedman, Benjamin M., "Debt and economic activity in the United States," in Benjamin M. Friedman, ed., *The changing roles of debt and equity in financing U.S. capital formation*, University of Chicago Press, 1982.

Lee, William, "Corporate leverage and the consequences of macroeconomic instability," Federal Reserve Bank of New York, research paper, No. 9012, May 1990.

McKenzie, Richard B., and Christina Klein, "The 1980s: a decade of debt?," Center for the Study of American Business, policy study, No. 114, October 1992.

Morck, Randall, Andrei Shleifer, and Robert Vishny, "The stock market and investment: is the market a sideshow?," *Brookings Papers on Economic Activity*, 1990:2, pp. 157-202.

Shoven, John B., and Joel Waldfoegel, "Introduction and summary," in John B. Shoven and Joel Waldfoegel, eds., *Debt, taxes, and corporate restructuring*, Washington, D.C., Brookings, 1990.

Warshawsky, Mark, "Is there a corporate debt crisis? another look," Federal Reserve Board of Governors, working paper, January 1990.