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Is Rising Leverage A Problem?

In recent years, firms in the United States have been increasing their debt and buying back equity. As a result, corporate leverage, or the aggregate debt-to-assets ratio, increased at an annual average rate of about three percent from 1982 to 1988, and firms' interest obligations relative to their cash flows increased by about four percent a year during that period.

For any given firm, this increase in interest obligations relative to cash flow implies that a higher threshold level of cash flow is needed to keep the firm solvent, making it more vulnerable to adverse economic conditions. Such an increase in the solvency risk of individual firms, in turn, may translate into increased risk to the economy as a whole, particularly if the highly leveraged firms are also highly cyclical, in the sense that their income and cash flow rise and fall with economy-wide activity. During recessions, the high leverage of these firms could exacerbate their cyclical difficulties, and could cause a liquidity contraction for financial institutions and a decrease in wealth for bondholders, resulting in a generalized credit squeeze in the economy.

This *Letter* outlines recent leverage patterns in the United States, reviews some explanations for the increasing reliance on debt, and examines whether the increasing leverage by firms in the United States presents a potential problem to the economy. There is some evidence that in recent years firms in cyclical industries have increased their leverage more rapidly than firms in non-cyclical industries. This trend raises some concern, particularly if it were to continue.

Leverage patterns in the U.S.

Firms in the United States have been increasing their leverage over the past several years. In a sample of 1,293 financial and non-financial firms for which data are available, the debt-to-asset ratio rose at an average annual rate of 2.6 percent, increasing from an average of 59 percent in 1982 to 68 percent in 1988. This increase in leverage also raised these firms' interest burden. The ratio of their interest expenses to cash flows increased by an average of 3.8 percent a year, from 15 percent in 1983 to 19 percent in 1988. This increase in interest burden is worth noting since the level of interest rates declined about two percentage points over the period.

Increasing leverage may be a response to recent changes in tax laws and the economic environment. Many economists have pointed out that our tax structure historically has favored the use of debt over equity since it in effect taxes dividend income twice, while it makes corporate interest payments tax deductible. Randall Pozdena at this Bank has shown that tax factors account for much of the observed variation in aggregate leverage in the manufacturing sector over the last 50 years.

Pozdena also found that the changes in the U.S. tax system effected by the 1986 Tax Act further biased corporate financial structure towards the use of debt because this Act raised the differential between the corporate tax rate and the personal marginal tax rate, increased the rate at which income from capital is taxed relative to ordinary income, and reduced the availability of such nondebt shields as the investment tax credit. In a previous issue of this *Letter* (November 24, 1989), Frederick Furlong confirms that the net effect of changes in marginal income tax rates, provided for by 1986 tax reform bills, was to increase the incentives to use debt.

Other reasons that have been cited for the rise in corporate leverage include recent developments in financial markets. For example, by making debt markets more complete, floating rate financing may have facilitated debt finance. Likewise, enhancements in the marketing of junk bonds, some have argued, facilitated debt finance particularly by corporations trying to avoid takeovers as well as by those having to restructure as a result of takeovers. Securitization also may have encouraged the growth of debt by lowering the

cost of debt through improved technology of debt issuance and, some argue, by obscuring the credit risks involved.

Leverage and risk

The trend towards increased leverage in recent years may have increased bankruptcy risk. Because they face higher interest obligations relative to their cash flow than do firms with low leverage, highly leveraged firms are more vulnerable to the declines in cash flow that often occur in recessions.

Economists Ben Bernanke and John Campbell found that many highly leveraged firms would have gone bankrupt in 1986 if these firms had encountered conditions like those during the recessions of 1973–74 and 1981–82. Faced with shocks of the magnitude of the 1973–74 recession, for instance, ten percent of these firms would have seen their debt-to-asset ratios rise above unity, thereby forcing them into bankruptcy. When the effects of the 1981–82 recession were simulated, the deterioration in leverage ratios was less dramatic, but still noticeable for firms with high debt-to-asset ratios.

In contrast, however, economist Michael Jensen has argued that highly leveraged firms are actually *less* vulnerable to bankruptcy than are low-debt firms because at the point of insolvency, when the total market value of assets is barely equal to the value of debts, creditors are more likely to restructure the debts of highly leveraged firms than they are the debts of low-leverage firms. He reasons that at the point of insolvency, the assets of highly leveraged firms necessarily are worth more than those of firms that previously had low leverage. Since the market value of the assets of highly leveraged firms needs to deteriorate only a little to make them insolvent, while asset value must deteriorate a lot to make a low-leverage firm insolvent, creditors are more likely to liquidate an insolvent firm that started out as a low-leverage firm.

Although Jensen's argument may have merit, nonetheless, increased leverage poses potentially greater risks of an economy-wide liquidity squeeze. Restructuring does not eliminate risk; it merely transfers bankruptcy risk to creditors. In an economic downturn in which a large number of highly leveraged firms are forced into restructuring their debt, creditors may become at least temporarily illiquid. This could lead to a credit squeeze on the rest of the economy, including healthy corporations, and thus feed recessionary tendencies in the economy.

Leverage and cyclicality

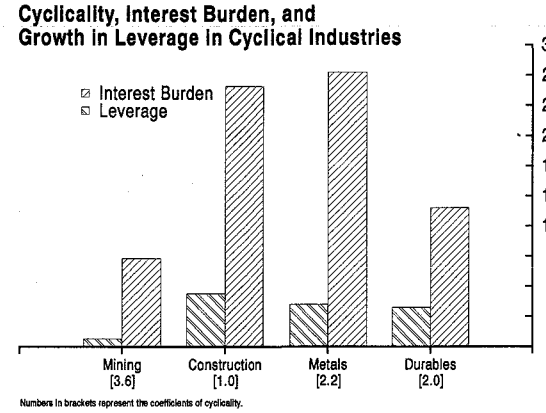
Thus, it appears that the trend towards increased leverage has the potential to increase bankruptcy risk within the economy as a whole, particularly if the increase in leverage is concentrated in industries that are highly cyclical. Accordingly, it is important to determine whether leverage has in fact increased in cyclical sectors of the economy. To obtain a measure of cyclicality, sectoral output is regressed on total private sector Gross Domestic Product, and the resulting slope coefficient is called the coefficient of cyclicality (COC). A COC equal to or greater than one means that product cycles in that sector are at least as pronounced as business cycles in the economy as a whole. These sectors are deemed "cyclical." On the other hand, a COC less than one means that business cycles are dampened in the sector, and such a sector is classified as "non-cyclical."

In the 1980s four of ten sectors had a COC greater than unity. They were mining, construction, primary metals (including transportation equipment), and other durable manufactures. These sectors account for a quarter of private sector output and half of the non-service component of private sector output.

As Charts 1 and 2 show, leverage, or the ratio of firms' debt to assets, increased in nine of the ten private sectors of the U.S. economy between 1982 and 1988. Excluding the financial sector, the highest growth occurred in three of the four cyclical sectors: construction, primary metals, and other durable manufactures. The only sector to register a fall in leverage over the period was utilities, the sector with the lowest COC, and thus the least cyclical of all the sectors.

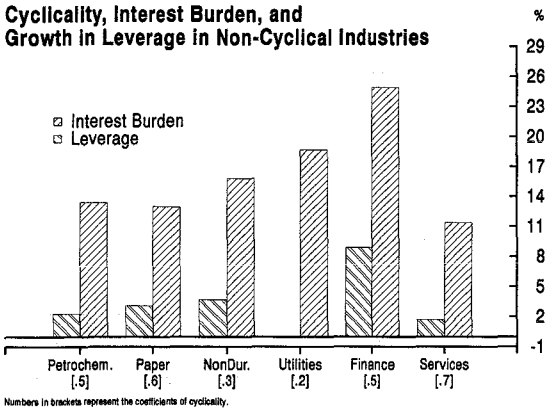
Chart 1

Cyclicality, Interest Burden, and Growth in Leverage in Cyclical Industries



Numbers in brackets represent the coefficients of cyclicality.

Chart 2
Cyclicality, Interest Burden, and Growth in Leverage in Non-Cyclical Industries



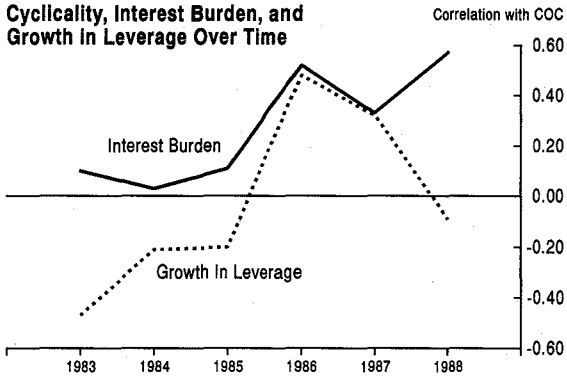
Numbers in brackets represent the coefficients of cyclicality.

The relationship between leverage and cyclicality can be tested statistically by calculating the correlation between the COC and various leverage indicators: the debt-to-assets ratio, the growth in the debt-to assets ratio, and the ratio of interest payments to cash flows. A strong positive correlation between COC and any of these indicators suggests that in recent years the economy has become more vulnerable to a credit squeeze than would be suggested by the rise in aggregate leverage alone.

The statistical analysis suggests that the *level* of leverage in the ten sectors, averaged over the years 1982 through 1988, is only very weakly related with the COC. This means that, on average in the United States, highly leveraged firms have not been particularly concentrated in cyclical sectors. However, the strength of correlation increased over the period, suggesting that firms in cyclical sectors are becoming more leveraged.

As Chart 3 shows, moreover, cyclical sectors were increasing their leverage more rapidly than were non-cyclical sectors over most of the period: the correlation between the annual *growth* in the debt-to-assets ratio and the COC steadily increased from -0.5 in 1983 to 0.5 in 1986. The correlation declined in 1987 but remained positive, indicating that cyclical sectors were still increasing their leverage more rapidly than were non-cyclical sectors. In 1988 the correlation decreased to approximately zero, but this is not cause for complacency since it is due to the fact that both cyclical and non-cyclical sectors were increasing their leverage equally rapidly. The yearly correlation coefficients between the COC and leverage indicators are a reliable measure of potential vulnerability especially since leverage in almost all of the ten sectors increased every year between 1983 and 1988.

Chart 3
Cyclicality, Interest Burden, and Growth in Leverage Over Time



Cyclical sectors also have seen a faster rise in interest burden, or the ratio of firms' interest obligations to cash flows, than have non-cyclical sectors. The correlation between interest burden and COC has increased fairly steadily over the period, as Chart 3 shows. This means that the economy as a whole has tilted towards greater vulnerability to recession shocks.

A cause for concern

Concerns over the rise in leverage in recent years are compounded by the fact that through 1987 firms in cyclical sectors have increased their leverage more rapidly than have those in non-cyclical sectors. As a result, the need for corporate restructuring likely will be higher in the event of an economic downturn, making an economy-wide credit squeeze a more serious threat.

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