

# In Brief

## Economic Capsules

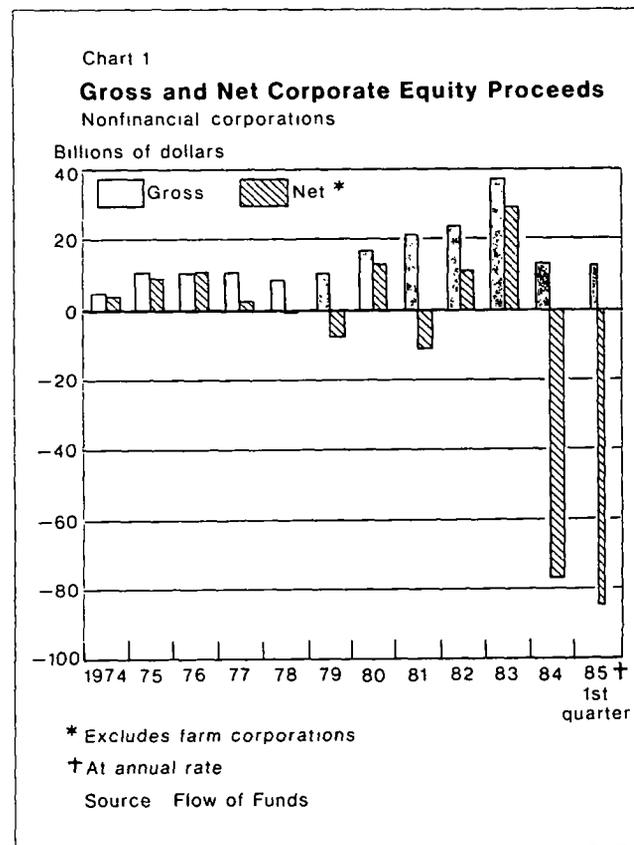
### Corporate Debt-Equity Ratios

Is U.S. business becoming undercapitalized? Since the end of 1983 nonfinancial business corporations, including those involved in mergers, acquisitions, buy-outs, stock repurchases, and related activities, have bought far more equities than they have issued. During 1984 companies issued \$13 billion in stock but purchased \$90 billion worth—a net retirement of \$77 billion (Chart 1). This trend has continued into 1985. Since the net reduction of equity capitalization has been mainly debt-financed, the question is whether or not the business sector is becoming too leveraged as a result.

To examine this, we constructed two corporate debt-to-equity ratios. Each compares the market value of corporate debt with a different equity concept. The equity concept in the first ratio is the market value of corporate preferred and common stock. The equity measure for the second ratio is net worth, based on the replacement cost of assets. This second equity measure equals an estimate of the current replacement cost of plant and equipment and inventories, plus the current value of land and other assets, minus our estimate of the market value of corporate debt (box).

These two ratios have differed considerably since the early 1970s (Chart 2). In 1973 and 1974 stock market values fell sharply, driving up the corresponding debt-equity ratio. But over the same period, rising prices of new corporate plant and equipment, inventories, and land caused a drop in the ratio of debt to net worth on the replacement cost basis. This sudden discrepancy between the market and book values of firms is somewhat of a mystery. In part it may have been due to rapid structural change in the economy (e.g., oil prices) or to

the interaction of inflation and the tax system. Inflation may also have made it difficult to realistically evaluate corporate assets. In addition, the overall swing in the stock market at the time partly reflected short-run variations in interest rates and earnings, which would not necessarily affect replacement values proportionately. Whatever the full explanation, it is apparent that the



causes of the deviation were not all transitory because the difference between the two ratios has persisted into the 1980s<sup>1</sup>

<sup>1</sup>For a discussion of the evaluation of corporate assets, see Franco Modigliani and Richard A. Cohn, "Inflation, Rational Valuation, and the Market", *Financial Analysts Journal*, Volume 35 (March-April 1979), page 25. For a discussion of the tax non-neutrality arguments (inventory valuation, depreciation, housing, etc.) see Marcelle Arak, "Inflation and Stock Values: Is Our Tax Structure the Villain?", *Quarterly Review* (Winter 1980-81), pages 3-13. The effect of

Which equity measure is better to use in assessing the financial condition of firms? Ideally it is best to know the real economic values of assets and liabilities. It is,

*Footnote 1, continued*

structural change in the form of rapid energy price increases, changes in foreign trade flows and defense spending, and the development of environmental and safety regulatory programs is discussed in Martin Neil Bailey, "Productivity and the Services of Capital and Labor", *Brookings Papers on Economic Activity I* (1981), pages 1-50.

### Calculation of Debt-Equity Ratios

Two debt-to-equity ratios for the nonfinancial corporate sector were constructed.\* The same measure of market debt is used in both, while the definition of equity differs.

The measure of corporate debt includes short-term debt (bank loans, commercial paper, bankers' acceptances, finance company loans, U.S. government loans, profit taxes payable, and trade debt) taken at par value and long-term debt (tax-exempt bonds, corporate bonds, and mortgages) estimated on a market-value basis.

For each year, we calculated a ratio of the market to par value of corporate bonds for U.S. companies listed on The New York Stock Exchange. This ratio was combined with par-value data on all nonfinancial corporations from Flow of Funds to estimate the market value of all nonfinancial corporations' bond debt.

The present value of all mortgage debt (home, multi-family, and commercial) owed by the nonfinancial corporate sector was derived by estimating the mortgages issued (MI) in each year from Flow of Funds mortgage outstanding data (MO).

It was assumed that all mortgage debt was issued with a 10-year—without amortization—maturity at the prevailing Moody's BAA corporate rate.

Mortgage debt retired (MR) in period  $t$  is defined as mortgage debt issued in period  $t-10$ .

$$(1) MR_t = MI_{t-10}$$

Mortgage debt outstanding in period  $t$  equals the sum of mortgages issued in periods  $t-9$  through period  $t$ .

$$(2) MO_t = \sum_{i=-9}^0 MI_{t+i}$$

Net mortgage debt issued (NI) is defined as the net change in mortgage debt outstanding.

$$(3) NI_t = MO_t - MO_{t-1}$$

Thus,

\*The nonfinancial corporate sector includes all private corporations not covered in the financial or farming sectors.

$$(4) MI_t = NI_t + MR_t \\ = NI_t + MI_{t-10}$$

Since we know  $NI_t$ , all we need is to estimate  $MI$  for the 10 years before 1945, when the Flow of Funds data became available. Mortgage issuance during that period is assumed equal to the level of mortgage debt outstanding in 1945 divided by 10. That is, we assume that an equal amount of the initial mortgage debt is issued each of the 10 years ending with 1945.

Using the mortgage debt issued series, the present value of all mortgage debt outstanding in each period is the sum of present values of all mortgages issued and not yet retired.

$$(5) PV_t = \sum_{i=-9}^0 \left[ \sum_{j=1}^{10+i} \frac{MI_{t-j} r_{t+j}}{(1+r_t)^j} + \frac{MI_{t+i}}{(1+r_t)^{10+i}} \right]$$

$r_t$  = Moody's BAA corporate rate

The first measure of equity, the market value of common and preferred stock† held by nonfinancial corporations, is a residual figure equal to the Security and Exchange Commission's calculation of all equities issued, less the Department of Commerce's estimate of equity issued by foreigners, less the Flow of Funds estimate of all equities issued by the financial sector.

The second concept of equity used, a measure of net worth, was derived by netting out total liabilities (as measured above) from total assets (financial assets, reproducible assets, and land).

Financial assets, based on Flow of Funds data, were taken at face value. Reproducible assets (residential structures, non-residential plant and equipment, and inventories), based on Commerce Department data, were valued on a current cost basis. That is, the assets were valued at the prices that would have been paid in the given period, net of straight line depreciation. The value of land holdings, measured in current market values, is estimated by the Federal Reserve Board.

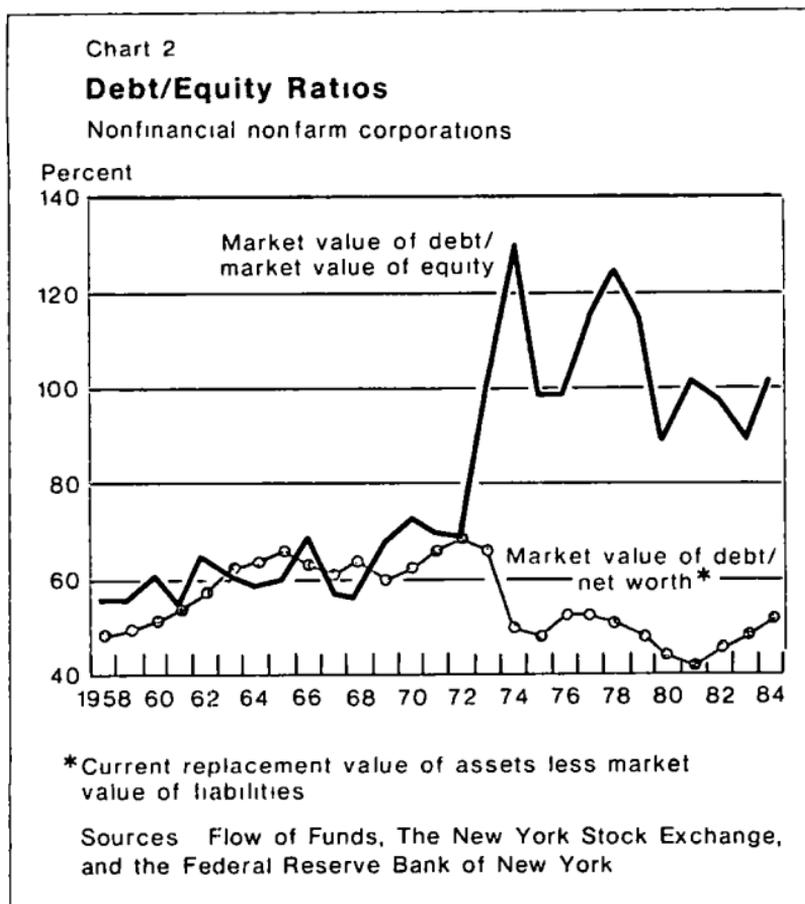
†This figure includes corporate farm equity.

therefore, tempting to rely more on prices in the equity markets. Alternatively, some explanations of the sharp divergence between market and book values in the 1970s focus on the claim that the market has erroneously undervalued firms, in which case the replacement cost net worth measure might be better<sup>2</sup>

Notwithstanding the great conceptual and quantitative differences between these alternative debt-equity ratios, both tell a similar story about the experience in 1984 (the last year for which data are available). Both ratios have risen, but each remains well within or below the range of experience since the early 1970s.

Therefore, at least on this aggregate level, the capitalization of the corporate sector does not appear out of line by past standards. There are important caveats to this, especially the fact that these aggregate debt-equity ratios do not show the variance among individual firms, some of which have increased their debt loads significantly. Moreover, even on an aggregate level, the cost of servicing debt has risen secularly, so that the proportion of gross corporate operating revenues absorbed by interest expenses remains high by historical standards. In addition, the proportion of corporate debt which is short-term has continued to rise steadily.

<sup>2</sup>On the undervaluation of firms, see Modigliani and Cohn, *op cit*



In conclusion, while indicators of corporate financial condition warrant close monitoring, mergers and related activities so far do not appear to have absorbed a disproportionate amount of overall business capital

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