Trends in Corporation Finance

By Karlyn Mitchell

The economywide turbulence accompanying policies designed to reduce inflation has forced agents in all sectors of the economy to modify their economic strategies. This is particularly true for nonfinancial corporations. Concern was expressed throughout the 1970s that managements of nonfinancial corporations were being lured by the prospect of ever-increasing prices to pursue risky financial policies.[1] The sudden reversal of the inflation outlook combined with the prospect of substantially slower growth in the immediate future has caused some observers to express concern over the solvency of corporate-sector enterprises during the transition period.[2]

In view of these concerns, this article analyzes recent trends in nonfinancial corporate finance and examines factors behind the trends. A hypothesis developed here is that while the financial strength of the corporate sector has apparently deteriorated when measured by conventional yardsticks, these yardsticks are not adequate for making historical comparisons of financial soundness. In particular, significant changes in financial markets and financial institutions have altered the norm for prudent corporate financial policies. The first section of the article examines aggregate financial data for the nonfinancial corporate sector and identifies three apparent shifts in financing patterns. The next three sections posit explanations for the trends identified in the first section. Conclusions are stated in the fifth and final section.

PATTERNS OF CORPORATION FINANCE

This section describes some of the major trends of the past two decades in financing by nonfinancial corporations. The first part of the section presents the principal corporate financial statements. The second part presents aggregate financial data for the nonfinancial corporate sector.

Corporate financial statements

Transactions that change the assets and liabilities of an ongoing business enterprise during an accounting period are summarized in its

[1] The financial condition of the corporate sector has served periodically as the subject of articles in popular financial magazines. See, for example, "The Debt Economy," *Business Week,* October 12, 1974, and "The Capital Cloud Over Smokestack America," *Fortune,* February 23, 1982.

[2] See Henry Kaufman, "Danger: Too Much Turbulence," *Challenge,* May/June 1982, pp. 4-14; "Do You Sincerely Want to End Inflation?" *Forbes,* March 29, 1982; and "Debt's New Dangers," *Business Week,* June 26, 1982.

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Table 1
SOURCES AND USES OF FUNDS*

Sources
Internal
Undistributed Profits (Retained Earnings)
Depreciation

External
Net Equity Issues
Net Debt Issues†

Uses
Net Increases in Financial Assets
Liquid Assets‡
Other Financial Assets§

Capital Expenditures
Plant and Equipment
Inventory Investment
Other Capital Assets

*Adapted from the Board of Governors of the Federal Reserve System, Flow-of-Funds Accounts.
†Debt includes both long-term and short-term debt. Long-term debt includes bonds, mortgages, and long-term bank loans. Short-term debt includes short-term bank loans and other loans, commercial paper, profit taxes payable, and trade debt.
‡Liquid assets include cash, demand and time deposits, U.S. government securities, and other marketable securities.
§Other financial assets include consumer and trade credit.

sources and uses of funds statement (see Table 1). Entries under the "uses" portion of the statement represent outlays made during the accounting period to acquire stocks of financial and nonfinancial assets. Financing for these acquisitions comes from internal sources (profits retained after dividend payments and reserves deductible under U.S. tax law for capital consumption) and external sources (funds raised through the sale of financial instruments). Since all the funds raised from a given source must be applied to one of the uses of corporate funds, the sources of funds sum to the total uses of funds.

While the sources and uses of funds statement summarizes transactions that affect an enterprise's assets and liabilities, the balance sheet presents the value of the assets and liabilities themselves at the close of an accounting period (see Table 2). Under historical cost accounting, the method on which most published corporate financial statements are based, the end-of-period balance sheet is computed by adding the components of the sources and uses of funds to the appropriate accounts in the balance sheet from the close of the previous accounting period. Hence, the debt liability outstanding at the end of an accounting period is the debt liability outstanding at the end of the previous period plus net debt issues from the sources and uses statement. Similarly, shareholders' equity at the end of an accounting period is the previous period's equity plus undistributed profits and net equity issues. Tangible assets—net plant and equipment, inventories, and other capital assets—equal the previous period's tangible assets plus capital expenditures less depreciation and sales. Under histori-

Table 2
BALANCE SHEET*

Assets
Liquid Assets
Other Financial Assets
Inventories
Net Plant and Equipment†
Other Capital Assets

Liabilities and Shareholders' Equity
Debt
Shareholders' Equity (Net Worth)
Paid-in Capital‡
Cumulative Retained Earnings

*Adapted from the Board of Governors of the Federal Reserve System, Balance Sheets for the U.S. Economy.
†Net plant and equipment is the sum of all past expenditures on plant and equipment less all past depreciation deductions and sales.
‡Paid-in capital is the sum of all past net equity issues.

cal cost accounting, the computed values of individual assets and liabilities are referred to as the book values of the accounts.[3]

Aggregate financial data

Historical financial statement data for the nonfinancial corporate sector are presented in Charts 1 and 2. Chart 1 presents components of the sources of corporate funds as a fraction of total sources. Chart 2 depicts the book values of selected balance sheet accounts divided by the book value of balance sheet assets.

An examination of the historical data reveals distinct trends in corporate indebtedness, in the average maturity of corporate debt, and in corporate liquidity. The first two trends can be seen from the aggregate sources and uses data. Except for the sharp reversals in 1975 and 1980, internal funds dwindled steadily as a source of funds. External funds increased as a proportion of total sources, with debt, rather than new equity, the primary external source of funds. Indeed, net new equity issues never accounted for more than 9 percent of total sources of funds, and in six of the past 22 years corporations repurchased more equity than they issued. In addition to the increase in debt financing, the use of short-term debt increased relative to long-term debt.

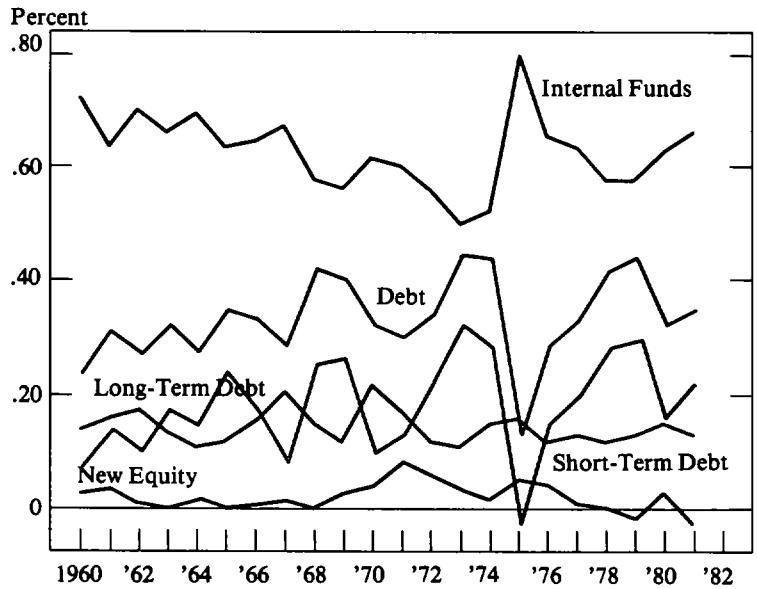
Historical cost balance sheet data point up the cumulative effects that trends in the sources of funds had on the composition of corporate balance sheets. From 1960 through the early 1970s, the effect of dwindling internal funds and low net equity offerings combined to cause a decline in shareholders' equity relative to total assets and a rise in debt relative to total assets. In book value terms, the debt-to-asset ratio rose from roughly 43 percent in 1960 to over 51 percent in 1973. The ratio then declined during the 1973-75 recession but rose again in the late 1970s. The average term to maturity of debt on the books of nonfinancial corporations declined from 1960 to 1981 as the short-term debt-to-asset ratio rose relative to the long-term debt-to-asset ratio. The data also show that corporate holdings of liquid assets—primarily cash, demand and time deposits, and government securities—declined relative to assets in the early 1960s.

By conventional measures, the trends in the composition of nonfinancial corporations' balance sheets in book value terms represent a shift to a riskier financial structure.[4] Because debt financing increases the fixed expenses corporations must pay, an increase in the debt-to-asset ratio raises the probability that low revenues might result in loan default and bankruptcy. Greater use of short-term debt increases vulnerability to interest rate movements and increases the probability that debt must be rolled over when credit conditions are tight. The si-

[3] Critics of historical cost accounting point out that it presents a distorted picture of a corporation's financial position when prices and interest rates change over time. These analysts favor market value accounting, which uses current market prices and replacement costs to value financial and depreciable assets, inventories, and liabilities. Under market value accounting, shareholders' equity, referred to as net worth, equals the market value of assets less the market value of liabilities. Hence, shareholders' claim on the corporation fluctuates with the market values of assets and liabilities.

[4] The corporate sector's financial structure is somewhat stronger when balance sheet assets and liabilities are valued at current market prices. Like historical cost financial statement data, market value data reveal declines in corporate liquidity and the average maturity of corporate debt. The corporate debt-to-asset ratio is substantially lower and the equity (net worth)-to-asset ratio substantially higher when accounts are valued at market prices, however. The net worth-to-asset ratio declined through the early 1970s but much less than the book value equity-asset ratio. Accelerating inflation and high interest rates in the late 1970s caused a sharp increase in the net worth-to-asset ratio and a steep decline in the debt-to-asset ratio by raising the market value of corporate assets and reducing the market value of long-term debt. As a result, total debt at the close of 1981 represented 33 percent of assets, in contrast to 47 percent based on historical cost data.

Chart 1
SOURCES OF FUNDS AS A FRACTION OF TOTAL SOURCES



SOURCE: Board of Governors

multaneous decline in the ratio of liquid assets to total assets and rise in the ratio of short-term debt to total assets increases the probability that corporations will encounter a liquidity shortage when economic activity is slow.

The financial condition of the nonfinancial corporate sector was weaker at the start of the 1980s than at the start of the 1960s whether measured in book value or market value terms. The position at the start of the 1980s, however, appears to have been the result of trends that persisted, with brief interruption, over the previous two decades. During that time, significant changes in institutions, regulations, and other factors affected corporate financial decisions as well as changes in expectations about the long-run inflation rate. To assess the riskiness of corporate financing strategies more accurately, it is necessary to examine the factors that precipitated these trends.

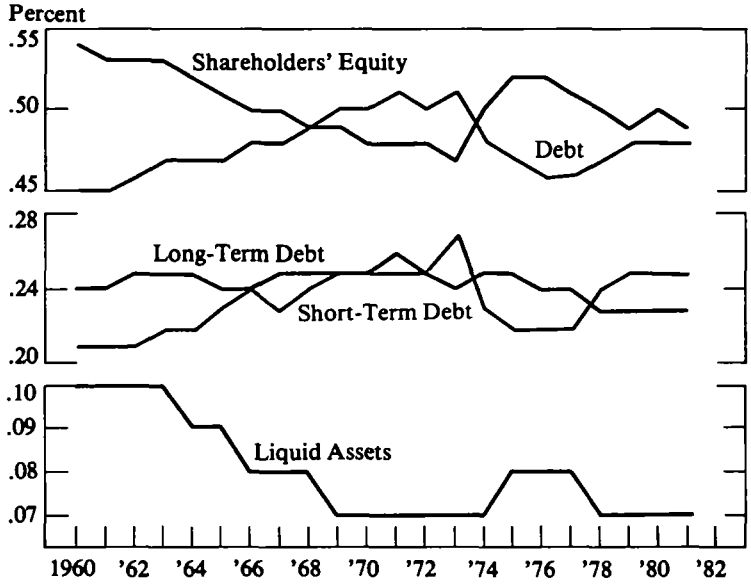
EXPLANATIONS FOR THE INCREASE IN DEBT RELATIVE TO ASSETS

Corporate financial managements increased corporate debt-to-asset ratios between 1960 and 1981. This trend came partly as a response to changes in the availability of internal funds and to factors favoring the issuance of new debt rather than new equity.

Factors affecting internal funds

Because of differential transaction costs, internal funds are a lower cost source of funds than external funds. When internal funds are plentiful, corporate debt-to-asset ratios fall because the acquisition of corporate assets is financed by retained earnings, a component of shareholders' equity. Except in the mid-1970s, and starting again in the late 1970s, the ratio of internal funds to total sources trended downward.

Chart 2
HISTORIC VALUE OF LIQUID ASSETS, LIABILITIES, AND EQUITY AS A FRACTION OF THE HISTORIC VALUE OF ASSETS



SOURCE: Board of Governors.

The ratio of internal funds to total sources was influenced primarily by two factors. One was the increase in corporate capital expenditures, which strongly influenced the adequacy of internal funds relative to total sources of funds. Corporate planners usually form capital spending plans before deciding how the spending will be financed. Consequently, the availability of funds from particular sources is a comparatively minor consideration in making capital spending decisions.[5] The decline in internal sources relative to total sources that occurred from 1960 to 1974 coincided with rapid growth in capital outlays both absolutely and relative to internal sources (see Table 3). The strength of investment spending during that period can be attributed to favorable trends in the principal determinants of investment spending: high levels of output and capacity utilization and low real after-tax capital costs. In 1975, however, brisk growth in capital outlays came to an abrupt halt with a 32 percent decline in outlays from the previous year. With the reduced need for funds, funds raised from external sources declined 64 percent from the year earlier and the ratio of internal funds to total sources reached its highest level since the early 1950s. Sluggish growth in investment spending in the late 1970s and early 1980s lessened corporations' need for external funds and prevented a further rise in debt-to-asset ratios.

[5] The conventional wisdom that managements make investment and financing decisions sequentially is supported by empirical evidence that investment and dividend decisions are made independently; see Eugene Fama, "The Empirical Relationships Between the Dividend and Investment Decisions of Firms," *American Economic Review,* June 1974, pp. 304-18. For an authoritative review of the determinants of investment decisions, see Dale Jorgenson, "Econometric Studies of Investment Behavior: A Survey," *Journal of Economic Literature,* December 1971, pp. 1111-47.

Table 3
SELECTED CORPORATE FINANCIAL STATISTICS

	1960-64	1965-69	1970-74	1975-81
Capital Expenditures as a Percent of Internal Funds	104.0	121.0	132.0	113.0
Rate of Return on Corporate Assets	4.9	5.6	4.0	4.7
Dividends as a Percent of After-Tax Profits	55.0	51.0	54.0	46.7
Short-Term Debt as a Percent of Long-Term Debt	89.4	97.3	98.6	100.0
Liquid Assets as a Percent of Short-Term Debt	44.5	30.4	30.0	31.5

NOTE: Profits are conventionally reported after-tax profits without inventory valuation and capital consumption adjustment. The rate of return on corporate assets is after-tax profits divided by tangible assets valued at replacement cost.
SOURCE: Board of Governors of the Federal Reserve System.

The other factor that directly affected the availability of internal funds—and hence the debt-to-asset ratio—was the combined effect of changes in corporate profitability and corporate dividend policy. The rate of return on the physical assets of nonfinancial corporations was higher in the mid-1960s than at any other time in the postwar era. In contrast, the return to capital was much nearer the postwar average in the 1970s[6] (see Table 3). Sharp declines in corporate profitability substantially reduced the flow of internal funds in 1969-70 and again in 1973-74. Corporate profits were so low in those years that the nonfinancial corporate sector would have had to rely on external sources of funds even if all profits had been retained.

Corporate directors influence the availability of internal funds by determining the fraction of profits paid out as dividends. Even though shareholders' long-term capital gains are taxed at a lower rate than dividends, corporations pay out a substantial proportion of profits as dividends (see Table 3). A well-supported theory of dividend policy asserts that corporate directors prefer to pay a constant fraction of after-tax profits as dividends, with the result that a dollar increase in after-tax earnings per share leads directors to increase dividends per share by $1 times the payout ratio. In the short run, however, directors' aversion to frequent changes in dividends paid per share causes smaller changes in dividends than changes in profits would justify. Consequently, the amount of dividends paid in the previous quarter is the primary determinant of dividends paid in the current quarter.[7]

The slow response of dividend policies to substantial changes in corporate profitability contributed to the decline in internal funds relative to total sources. Since the rate of return on corporate assets and the dividend payout

[6] While it is apparent that the average return on corporate assets declined in the late 1960s and was substantially lower in the 1970s than in the previous decade, analysts are not agreed on the causes. Research has focused on two issues: whether the decline in corporate profitability represents a long-run trend or a temporary fluctuation and whether the interactive effects of inflation and the structure of corporate income taxes have reduced the after-tax return on capital. For a summary of the research, see Martha Scanlon, "Postwar Trends in Corporate Rates of Return," in *Public Policy and Capital Formation,* Board of Governors of the Federal Reserve System, 1981, pp. 75-87.

[7] This theory was first proposed by John Lintner, "Distributions of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes," *American Economic Review,* May 1956, pp. 97-113. Studies published in the 1960s continued to support Lintner's original hypothesis that corporations display inertia in paying dividends.

ratio moved inversely over the past two decades, the decline in corporate profitability in the late 1960s and 1970s was accompanied by an increase in the fraction of profits paid as dividends.[8] This, in turn, forced nonfinancial corporations to rely more on external sources of funds and contributed to the rising debt-to-asset ratio.

Factors favoring debt finance

Shortfalls in the availability of internal funds over the past two decades made nonfinancial corporations increasingly dependent on external funds. The structure of corporate and personal income taxes and the relative costs of debt and equity caused corporate managements to prefer debt.

The feature of the corporate tax code that most strongly favored debt finance was the deductibility of interest expenses from gross corporate income in computing taxable income. The shielding effect of debt on after-tax income can be illustrated with a simple example. Suppose a corporation has $100 of earnings before taxes, $20 in interest expenses, and a marginal tax rate of 50 percent. If interest expenses were not deductible, the corporation would have after-tax income of $100 \times 0.5 = $50 and profits after taxes and interest of $50 − $20 = $30. Since interest expenses are deductible from gross income, however, the corporation has after-tax income of 0.5($100 − $20) + $20 = $60 and profits after taxes and interest of $60 − $20 = $40, which is $10 more. Because tax deductible interest expenses increase profits available to shareholders by shielding a portion of income from taxes, managements can increase shareholders' return on equity by relying on debt to finance capital expenditures.

Starting in 1966, rising inflation increased the tax advantage of debt finance both by raising nominal interest rates and raising capital income's exposure to taxation. As market participants revise their inflation expectations upward, nominal interest rates also rise. This increases the tax deductible interest expense and the tax shield on corporate income. Hence, inflation increased the advantage to shareholders of corporate debt finance.[9] Inflation combined with accounting practices which raised potential corporate tax liabilities further encouraged the use of corporate debt. First-in first-out (FIFO) inventory accounting and historical cost-based depreciation deductions overstate before-tax income during an inflation by understating costs.[10] By relying more heavily on debt

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[8] The correlation coefficient between these two variables was −0.59.

[9] For a theoretical demonstration, see Robert Taggart, "Secular Patterns in Corporation Finance," National Bureau of Economic Research Working Paper No. 810, December 1981. Rising nominal interest rates encourage managements to increase their use of debt subject to the proviso that the probability of costly default is relatively low.

[10] The FIFO method of inventory accounting overstates profits in times of inflation because it uses the prices paid for goods longest held in inventory to calculate the cost of goods produced. Last-in first-out (LIFO) inventory accounting results in a smaller overstatement of before-tax income because it uses the prices paid for goods most recently put into inventory to calculate the cost of goods produced. Despite the tax advantages of LIFO, FIFO continues to be used by roughly three-quarters of manufacturing corporations. The inventory valuation adjustment (IVA) made in the national income accounts corrects for the overstatement of profits caused by FIFO by effectively putting firms on LIFO. When the IVA is made to aggregate corporate profits from 1960 to 1981, adjusted profits are substantially lower.

Historical cost tax depreciation overstates profits during inflations by making the depreciation deduction for the replacement of capital too small. This is because the depreciation deduction is based on the price of the capital goods when they were purchased, rather than the current cost of replacing the goods. The purchasing power of the depreciation deduction is also affected by accelerated depreciation. Under accelerated depreciation, a corporation can deduct more from before-tax profits than the value of capital assets used in production during the early years of an asset's life. The capital consumption adjustment (CCA) in the national income accounts corrects for the distortion

sources of funds, corporate managements reduced taxable income by raising tax-deductible interest expenses.[11]

Shifts in the ownership of financial wealth within the investor sector also contributed to the increase in corporate debt-asset ratios by changing the impact of the tax structure on investment income. The structure of personal income taxes affects the composition of corporation finance, since it is primarily investors who determine the relative prices (required rates of return) at which corporations offer debt and equity securities. From 1960 to 1981, investors in the household sector held between 74 and 88 percent of nonfinancial corporate equities. Tax regulations on personal investment income should have tended to lower both corporate debt-asset ratios and dividend payout ratios, since interest and dividends paid to individuals are taxed at the ordinary rate while capital gains are taxed when realized at about half the ordinary rate. Moreover, the rise in the effective tax rate on personal income between 1960 and 1981 should have caused managements to reduce debt-asset ratios rather than increase them.

There are two explanations for the failure of personal income taxes to influence corporation finance more strongly. First, empirical evidence suggests that taxes are not a major consideration for most individuals that invest in corporate securities.[12] Second, the growth of financial intermediaries contributed to the greater use of debt by corporations, by changing the legal restrictions on and the tax characteristics of the population of investors.[13] The larger the pro-

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to profits caused both by historical cost depreciation and by accelerated depreciation. When the CCA is made to aggregate corporate profits, adjusted profits are slightly higher from 1960 through 1973 and lower from 1974 through 1981.

When the IVA and CCA are both made from 1960 to 1981, adjusted profits of nonfinancial corporations are lower than the profits on which corporations paid taxes. Hence, the net effect of standard accounting practices was to increase the tax liabilities of nonfinancial corporations during this period.

11 Several researchers have attributed the rise in the indebtedness of nonfinancial corporations to the overstatement of taxable income caused by FIFO and historical cost accounting. See, for example, Scanlon. For a formal theoretical treatment of how tax shields affect corporation debt finance, see Harry D. Angelo and Ronald Masulis, "Optimal Capital Structure Under Corporate and Personal Taxation," *Journal of Financial Economics,* March 1980, pp. 3-29.

12 The nexus between the structure of personal income taxes and corporation finance has been studied in two contexts. Because interest expenses are tax deductible for individuals as well as for corporations, it has been theorized that investors sort themselves into "financial leverage clienteles." Specifically, individuals taxed at a marginal rate higher than the corporate tax rate, $t_p^h > t$, will borrow to purchase stock in corporations with low debt-asset ratios because their tax shield, $t_p^h B$, is larger than the corporate tax shield, tB, where B is the tax deductible interest expense. Conversely, individuals taxed at a marginal rate lower than corporations, $t_p^l < t$, will hold stock in corporations with high debt-asset ratios because $t_p^l B < tB$. The only empirical evidence on the leverage clientele theory has been presented by E. H. Kim, W. Lewellen, and J. McConnell, "Financial Leverage Clienteles: Theory and Evidence," *Journal of Financial Economics,* March 1979, pp. 89-109. The hypothesis that investors sort themselves into leverage clienteles was overwhelmingly rejected by the data.

It has also been theorized that transaction costs, uncertainty, and differences in the taxation of capital gains and dividends cause investors to sort themselves into "dividend clienteles." Since long-term capital gains are taxed at approximately half the rate as dividends, investors taxed at a low marginal rate will hold high dividend-yielding stocks, while investors taxed at a high marginal rate will hold low dividend-yielding stocks. The evidence on the existence of dividend clienteles is mixed. Studies that reject this hypothesis include Fischer Black and Myron Scholes, "The Effects of Dividend Yield and Dividend Policy on Common Stock Returns and Prices," *Journal of Financial Economics,* May 1974, pp. 1-22; and R. Gordon and D. Bradford, "Taxation and the Stock Market Valuation of Capital Gains and Dividends," *Journal of Public Economics,* October 1980, pp. 109-36. The opposite conclusion is reached by R. Pettit in "Taxes, Transaction Costs, and the Clientele Effect of Dividends," *Journal of Financial Economics,* December 1977, pp. 419-36.

13 Commercial banks, which consistently showed strong growth in the aggregate, are prohibited from holding stock in nonfinancial corporations but are allowed to hold bonds and other corporate loans. Private pension funds, state and

portion of corporate securities held by financial intermediaries, the smaller the impact of the structure of personal taxes on corporate financing decisions.

Managements of nonfinancial corporations also preferred debt to new equity finance because of the persistently higher cost of equity capital. Managers take relative capital costs into account in order to maximize the return on equity of current shareholders by limiting the distribution of corporate income to new security holders. Empirical studies show that relative capital costs are important in corporations' decisions to offer debt or new equity.[14]

Table 4 presents data on the costs of debt and equity capital from 1960 to 1981. The real cost of debt capital to a corporation is one minus the tax rate multiplied by the current yield on long-term bonds, minus the inflation rate. The cost of equity capital equals annual after-tax profits divided by the current market value of the corporation's outstanding shares. The third column of the table shows the difference between the costs of the two sources of funds. Cost differentials were particularly favorable to debt finance in the second half of the 1960s and again in the second half of the 1970s. The discrepancy was particularly striking during the latter period. In contrast to the 1960s, when the high relative cost of equity was due to high profit rates, the high relative cost of equity in the 1970s was due to the extremely low value of corporate equities. Although there is not agreement on the cause of low stock prices, factors frequently mentioned include extreme pessimism over future corporate profits, expectations of high rates of inflation, and increases in housing prices.[15]

Table 4
COST OF CAPITAL FOR NONFINANCIAL CORPORATIONS

Year	Cost of Equity*	Cost of Debt†	Discrepancy
1960-64	5.6	0.7	4.9
1965-69	6.2	−0.8	7.0
1970-74	4.2	−1.8	6.0
1975-81	6.4	−2.5	8.9

*Cost of equity equals profits of nonfinancial corporations including the cost inventory valuation and capital consumption adjustments (IVA and CCA) divided by the market value of equity.
†Cost of debt equals Moody's Aaa corporate bond yield multiplied by one minus the corporate tax rate less the percentage change in the implicit GNP deflator.
SOURCE: Board of Governors of the Federal Reserve System.

The combined impact on the debt-to-asset ratio of factors affecting the flow of internal funds and favoring debt over equity finance can be summarized as follows. The declining ratio of internal funds to total sources was due to relatively high dividend payout ratios in the early 1960s and to the brisk growth of capital expenditures in the mid and late-1960s. In the early 1970s, high capital expenditures, low profitability, and high payout ratios all contributed to the decline in the internal funds relative to total sources. While these developments forced corporations to rely more on external sources of

local government retirement funds (two of the fastest growing types of intermediaries), and life insurance companies can hold both debt and equity; the income from these investments is exempt from corporate income taxes. Instead, the beneficiaries are taxed on the income received from these institutions.

14 See Allen Taub, "Determinants of the Firm's Capital Structure," *Review of Economics and Statistics,* November 1979, pp. 410-16; and A. Nakamura and M. Nakamura, "On the Firm's Production, Capital Structure, and Demand for Debt," *Review of Economics and Statistics,* August 1982, pp. 384-93.

15 The failure of stock prices to rise along with the value of corporations' physical assets has been the subject of a vast amount of recent economic research. For a discussion of the issues, see Douglas K. Pearce, "The Impact of Inflation on Stock Prices," *Economic Review,* Federal Reserve Bank of Kansas City, March 1982, pp. 3-18.

funds, the structure of corporate and personal income taxes and the higher relative cost of equity capital caused corporate managements to prefer debt financing. Consequently, the debt-to-asset ratio of the nonfinancial corporate sector rose from 1960 through the mid-1970s. In the late 1970s and early 1980s, slower growth in capital expenditures, greater profitability, and lower payout ratios increased the availability of internal funds and reversed the rise in the debt-to-asset ratio.

EXPLANATIONS FOR THE DECLINING MATURITY OF CORPORATE DEBT

Throughout most of the last two decades, the average term to maturity of corporate debt declined as the ratio of short-term debt to long-term debt increased. Explanations for this trend include changes in the durability of corporate assets and a shift in investor preferences toward short-term securities.

Changing durability of corporate assets

According to conventional wisdom, corporate managements try to maintain parity between the average term to maturity of corporate liabilities and the term to maturity (the durability) of corporate assets. By matching maturities, managements hope to reduce capital costs by reducing the effect of interest rate fluctuations on net worth. The ratio of net worth to debt is often used as a measure of corporate financial soundness. This is because the larger and more stable the net worth-to-debt ratio over time, the lower the profitability of insolvency and bankruptcy.[16] By reducing fluctuations in net worth, a maturity-matching strategy tends to reduce a corporation's cost of capital by reducing the risk premium that investors in a corporation's debt and equity securities require.[17]

Since recent empirical studies support the hypothesis that corporate managements approximately match asset and liability maturities,[18] the decline in the average term to maturity of corporate debt should have been due partly to a

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[16] The net worth-to-debt ratio has been described as the most fundamental long-range measure of a corporation's financial strength. See Edgar Fiedler, *Measures of Credit Risk and Experience,* National Bureau of Economic Research, 1971, Chapter 5. In an article summarizing 26 empirical studies using financial ratios to forecast financial conditions and performance of nonfinancial corporations, the net worth-to-debt ratio was the financial ratio most frequently found to have a predictive power. See Kung Chen and Thomas Shimerda, "An Empirical Analysis of Useful Financial Ratios," *Financial Management,* Spring 1981, pp. 51-60.

[17] How maturity matching reduces variations in net worth can be illustrated by two examples. In the first example, suppose a corporation holds a short-term asset expected to pay $100 in one year and a $100 debt also due in one year. If the current interest rate is 10 percent, the current market value of both the asset and liability is $100/(1+.10) = $90.90. Net worth is zero. An increase (decrease) in the interest rate to 11 percent (9 percent) causes the value of both the asset and the liability to fall (rise) to $90.10 ($91.74). The interest rate change leaves net worth unchanged at zero because the asset and liability represent offsetting cash flows at the same point in time. In the second example, the corporation has the same asset as in the first example and a debt of $235.77 due in 10 years. If the current interest rate is 10 percent, net worth is zero since the current value of the debt is $235.77/$(1+.10)^{10}$ = $90.90. However, an interest rate increase (decrease) to 11 percent (9 percent) causes net worth to go from zero to $7.07 (−$7.86) by decreasing (increasing) the current value of the liability to $83.03 ($99.60). Because the asset and liability represent unsynchronized cash flows, the interest rate change affects the current values of the asset and liability differently and, hence, affects net worth. In the second example, if the interest rate declines and the corporation is forced to liquidate, the creditor would have a capital loss.

[18] William White, "Debt Management and Form of Business Financing," *Journal of Finance,* May 1974, pp. 565-77; and Robert Taggart, "A Model of Corporate Financing Decisions," *Journal of Finance,* December 1977, pp. 1467-84. White found that a one dollar increase in plant and equipment investment, investment in liquid assets, and inventory investment caused net long-term bond offerings to increase by $0.41, $0.31, and $0.25, respectively. Taggart found support for the hypothesis that managements use long-term debt to finance fixed investment and the permanent component of inventories, and use short-term debt to finance transitory inventories and liquid asset accumulation.

Table 5
PRINCIPAL HOLDERS OF CORPORATE SECURITIES, 1960-80
(In billions of dollars)

	1960	Percent of Total Outstanding	1980	Percent of Total Outstanding
Commercial Banks				
Total Financial Assets	224.2		1,244.7	
Loans to Nonfinancial Corporations	37.6	100.0	296.5	100.0
Households				
Total Financial Assets	973.4		2,241.3	
Corporate Bonds	10.0	11.1	86.9	17.2
Corporate Equities	395.5	87.7	1,215.6	74.3
Selected Nonbank Financial Intermediaries*				
Total Financial Assets	173.6		954.7	
Corporate Bonds	70.9	78.6	331.6	66.0
Corporate Equities	22.1	4.8	273.0	16.6

*Includes life insurance companies, private pension funds, and state local government retirement funds.
SOURCE: Board of Governors of the Federal Reserve System.

decline in the durability of corporate assets. Assets that are liquidated in a year or less, such as financial securities and inventories, comprised a stable proportion of total assets from 1960 to 1981. The durability of fixed capital declined steadily, however, as an increasing share of corporate capital budgets went to relatively short-lived equipment and a decreasing share went to long-lived structures. The shift caused the maturity of corporate assets to decline.[19] Since managements practiced maturity-matching strategies, the declining maturity of corporate debt reflected, in part, the declining maturity of corporate assets.[20]

Investor preferences

Substantial shifts in the composition and size of the financial portfolios of the investor sector probably contributed to the trend toward shorter term credit market debts for nonfinancial corporations. Some of these developments are highlighted in Table 5, which shows the financial asset holdings of principal investors in corporate securities in 1960 and 1980. Both life insurance companies and private pension funds reduced their holdings of long-term corporate bonds relative to their total financial assets. Even though state and local government retirement funds increased their bond holdings relative to assets, the proportion of bonds held by these three investor categories fell. Commercial banks, whose term loans have original maturities of 10 years or less, increased the propor-

[19] Expressed in billions of 1972 dollars, the nonfinancial corporate sector's investment in nonresidential structures as a percentage of equipment was: 1960-64, 77.0; 1965-69, 66.3; 1970-74, 56.3; 1975-81, 42.1.

[20] The change in the composition of business-fixed investment has been attributed to the bias of the tax structure favoring equipment and to relative prices. For a recent discussion of these issues, see Robert Tannenwald, "Federal Tax Policy and the Declining Share of Structures in Business Fixed Investment," *New England Economic Review*, July-August 1982, pp. 27-39.

tion of loans to nonfinancial corporations in their asset portfolios. Households also increased their holdings of corporate bonds relative to financial assets.

The growing volatility of interest rates combined with the tendency for more corporate debt to be held by households and institutional investors with fairly short-term liabilities probably contributed to the declining maturity of corporate debt by reducing the supply of long-term credit. Like corporations, investors can reduce fluctuations in their net worth by matching the maturities of their assets and liabilities. Hence, as investors with a strong preference for credit instruments of shorter maturity became a more important source of credit, nonfinancial corporations were probably forced to tailor their debt offerings to the market.[21].

EXPLANATIONS FOR THE DECLINE IN LIQUID ASSETS RELATIVE TO TOTAL ASSETS

Liquid assets held by nonfinancial corporations fell sharply in the first half of the 1960s relative to both total assets and short-term debt.[22] Contributing to the decline were significant developments in financial markets that enhanced the ability of corporations to raise funds quickly. Two of the more important developments were the growth of the commercial paper market and the greater use of bank loan commitments.

The commercial paper market

At the start of the 1960s, commercial paper was a source of funds little used by nonfinancial corporations.[23] The situation began to change in 1966 when interest rates exceeded the Regulation Q ceilings, causing funds to flow out of banks and thrifts.[24] Many of the largest nonfinancial corporations responded to the shortage of bank credit by placing their short-term obligations with investors in the household, financial, and business sectors through commercial paper dealers. The commercial paper market has grown rapidly since then as the number of corporations issuing paper increased and as managements substituted more open-market credit for bank credit. The development of this market probably helped reduce corporate holdings of liquid assets in two ways. First, corporations issuing commercial paper are not required to maintain compensating balances in proportion to the liability, as they are under most bank loan agreements. Second, since commercial paper can be issued with little delay to a national market, corporations with access to the market are free of the need to hold low-yielding liquid assets against the possibility of having their credit rationed by their banks.

Bank loan commitments

The credit shortages of the mid and late-1960s also caused the use of bank loan commitments to become widespread. A loan commitment is essentially a promise by a bank to make credit available to a client at the client's discretion any time during the term of the commitment. The term over which credit extension is guaranteed depends on the type of agreement. Under an open line of credit, a client can borrow during a period—usually a year—any amount up to a prearranged max-

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21 A similar argument is suggested by Robert Taggart (1981).

22 The decline in corporate liquidity is more dramatic when measured by the ratio of liquid assets to marketable short-term debt. The historical averages for this ratio are: 1960-64, 1.6; 1965-70, 1.0; 1971-74, 0.8; 1975-81, 0.7.

23 Commercial paper is unsecured promissory notes maturing in one year or less.

24 The Federal Reserve System's Regulation Q specifies maximum interest rates that member banks can pay on deposits. Similar interest rate restrictions apply to nonmember banks and other depository institutions.

imum. A revolving credit allows the client to borrow varying amounts during a term that normally lasts from two to three years. Banks also commit themselves to make term loans with maturities of up to 10 years. In return for the guarantee of credit, the corporation pays a commitment fee in addition to the interest on loans actually taken down. More than half of the currently outstanding commercial and industrial loans were made under commitments. By guaranteeing the availability of funds, the effect of loan commitments has probably been to reduce corporate holdings of liquid assets.

SUMMARY AND CONCLUSIONS

By conventional yardsticks, financial data for the aggregate nonfinancial corporate sector reveal a progressive weakening in the strength of corporate balance sheets. Over the past two decades, debt liabilities have increased relative to total assets, while the ratio of shareholders' equity to total assets, the average maturity of corporate debt, and corporate liquidity have declined. These changes have increased the apparent riskiness of corporate balance sheets by raising fixed payment obligations, increasing the frequency of debt refinancings, and reducing the ability of corporate enterprises to withstand shortfalls in revenues.

This article has analyzed whether corporate-sector financial soundness has, in fact, deteriorated when changes in financial market institutions are taken into account. The evidence suggests that the erosion in corporate solvency is much less severe than conventional criteria imply. Such developments as the expansion of the commercial paper market and the greater use of bank loan commitments may have led to a reduction in liquid assets relative to total assets without a decline in corporate liquidity. Also, to the extent that the declining maturity of corporate debt was matched by a decline in the maturity of corporate assets, the riskiness of corporate financial positions has not been affected.

Clearly, the riskiness of corporate financial positions was increased by the secular rise in the corporate debt-to-asset ratio. The risk was not assumed without the anticipation of eventual reward, however. The corporate debt-asset ratio rose partly because corporations had more profitable investment opportunities than could be financed internally. This ratio also rose because of the persistence of substantial cost and tax advantages to debt finance. Viewed in this light, the apparent deterioration in corporate financial soundness was actually the result of prudent management.

Despite the factors favoring the use of borrowed funds, the corporate debt-asset ratio rarely exceeded 50 percent in book value terms or 40 percent in market value terms. The most likely explanation for this seeming paradox is that corporate managements select debt-asset ratios by trading off the potential risks to shareholders against the potential returns from assuming additional risks.[25]

Following this reasoning, it can be argued that the decline in the corporate-sector debt-asset ratio starting in 1974 was the response of risk-averse managements to greater uncertainty caused by unanticipated price shocks and growing volatility in interest rates and inflation. Until the volatility associated with the transition to a lower inflation rate subsides, managements of nonfinancial corporations can be expected to continue lowering their debt-asset ratios as a risk-reducing measure.

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25 Other factors that may limit corporate use of debt include legal restrictions imposed by creditors and the distribution of investors among tax brackets.