The Market for Corporate Bonds

The market for corporate bonds has undergone a number of major changes over the past fifteen years. Perhaps the most striking has been the increased purchase of corporate bonds by households. During the 1950's and early 1960's, households invested heavily in corporate equities Then, as the bull market in equities ended in the mid-1960's and interest rates began rising sharply, households increased their corporate bond holdings relative to those of equities Pension funds also began to channel large amounts of funds into the corporate bond market because of the large inflows they were receiving as well as a broadening of the authority of many public pension funds (state and local government retirement funds) to include investments in corporate bonds The increase in household and pension fund holdings of corporate bonds has meant that these investor groups now rival life insurance companies as major suppliers of funds to the corporate bond market.

On the issuer side of the market, corporations have made large adjustments in their approach to financing From 1960 through the early 1970's, corporations increased the debt portion of their capital structures. Financial leverage—or the ratio of debt to total financing—of nonfinancial corporations rose by about one fifth, and the ratio of bonds to total financing rose somewhat more moderately. A lower level of uncertainty or expected variability of corporations' income before interest and taxes may have encouraged corporations to increase debt financing during the early and mid-1960's. From 1968 through 1974, a new factor was at work: higher rates of inflation encouraged firms to issue debt as the real or inflation-adjusted cost of debt financing declined. In 1975, however, financial leverage declined for the first time in fifteen years. The decline occurred in part because of the reduction of short-term debt as inventories were liquidated and may also have reflected the response of corporations to greater economic uncertainty.

Borrowing and lending decisions in the corporate bond market have resulted in an 8½ percent annual growth rate since 1960 in the outstanding stock of corporate bonds. At the end of 1976, the total outstanding amounted to $323 billion, about one third more than that of state and local government securities and about half as much as that of home mortgages and United States Treasury securities. Borrowing and lending decisions—particularly those involving substitution between corporate bonds and other instruments by both issuers and purchasers of corporate bonds—affect not only the size and rate of growth of the corporate bond market but also the effectiveness of selective credit and other public policies designed to alter the price and quantity of particular financial securities, such as home mortgages or state and local government obligations.

Purchasers of corporate bonds, 1960-76

The major purchasers of corporate bonds are life insurance companies, households, private pension funds, public pension funds, and mutual savings banks Data on the distribution of holdings among these purchasers are presented in Table 1. The largest and steadiest buyers of corporate bonds have been life insurance companies. The bulk of these companies' investments are confined to bonds and real estate mortgages. Inflows of life insurance premiums create actuarially determined outflows, most of which are expected to occur far in the future, and these inflows must be invested to insure that those distant liabilities are covered. Corporate bonds are attractive instruments, because they insure a specific cash flow over a long

Table 1

Holdings of Corporate Bonds Outstanding

In billions of dollars

Sector	1950	1960	1970	1976
Households*	5	10	36	72
Life insurance companies†	25	48	74	122
Private pension funds	3	16	30	39
Public pension funds‡	1	7	35	67
Mutual savings banks	2	4	8	20
Other	4	5	19	34
Total	40	90	202	354

Table 2

Importance of Corporate Bonds in Purchasers' Portfolios

Corporate bonds as a percentage of total financial assets of purchasers

Sector	1950	1960	1970	1976
Households*	1 0	1 0	1 9	2.5
Life insurance companies†	40 0	41 0	37 0	39 0
Private pension funds	40 0	42 0	27 0	22 0
Public pension funds‡	10 0	37 0	58 0	54 0
Mutual savings banks	9 0	9 0	10 0	15 0

Corporate bond holdings include dollar-denominated bonds issued by foreign corporations in the United States market The volume of these "Yankee bonds" increased from $6 billion in 1960 to $31 billion in 1976

* "Households" includes funds held by commercial banks in trust accounts and funds held by nonprofit organizations

† Includes private pension funds managed by life insurance companies

‡ State and local government retirement funds

Source Board of Governors of the Federal Reserve System

period and their yields are higher than on government bonds. Insurance companies can accept the lower marketability of most corporate bonds, compared with government bonds, since they generally expect to hold them until maturity regardless of interim movements in interest rates and bond prices. Not all corporate bonds are acceptable to life insurance companies, however. These companies are extremely averse to the provisions in many corporate bonds for redemption and refunding prior to the scheduled maturity date, for such provisions create uncertainty about investment income during the period from the refunding to maturity. (Refunding provisions and other investment characteristics of corporate bonds are described in the box on page 30.)

While life insurance companies have remained the largest holder of corporate bonds, the amount they held relative to the total outstanding fell from 53 percent in 1960 to 35 percent in 1976. This occurred mainly because growth in the assets of life insurance companies was slower than the growth in the outstanding volume of corporate bonds. However, as revealed in Table 2, where each sector's corporate bond holdings are expressed as a percentage of the purchaser's portfolio of financial assets, a shift in life insurance company assets from corporate bonds to other assets also made a minor contribution to the reduction of their share of the amount outstanding.

Household investment portfolios are more diversified than those of life insurance companies and include large amounts of short-term securities, equities, and municipal bonds, as well as corporate bonds. Since households have greater flexibility in making portfolio choices, their participation in the corporate bond market has varied a great deal over the post-World War II period. Their holdings have shown a marked increase since 1960, both as a percentage of total corporate bonds outstanding and of total household assets The increase in long-term rates and the weak performance of the equity market contributed to this shift.

The corporate bond holdings of private and public pension funds have grown even more in value since the 1960's, almost reaching the level of life insurance company holdings. This development primarily reflects the rapid growth in total assets of pension funds. For public pension funds, corporate bonds also rose as a percentage of their total assets over the period, as the broadening in their investment authority enabled them to buy corporate bonds and so obtain the higher returns available on them in comparison with those on government bonds. By contrast, corporate bonds declined as a percentage of the total assets of private pension funds after 1960 as these funds increased the equity or variable income portion of their portfolios.

Still, the corporate bond portion of both public and private pension fund assets greatly exceeds that of households. Pension funds are exempt from taxes on all forms of investment income—interest payments, dividends, and capital gains. Households are taxed at the full personal income tax rate on interest and dividends, while the tax rate on capital gains is, of course, lower. Households are, therefore, sensitive to whether income arises from interest or capital gains, whereas pension funds are not. The differential tax treatment is thus a major reason for the difference in investment choices of the two groups.

Mutual savings banks also purchase sizable amounts of corporate bonds Their holdings have risen sharply since the 1960's, reflecting both an increase in the corporate bond portion of mutual savings bank assets (Table 2) and growth in the total assets of these banks. The increase in the corporate bond portion was matched by a decrease in mortgage holdings relative to total assets. Savings and loan associations, the other major group of thrift institutions, hold almost all of their assets in home mortgages.

How corporate bonds are marketed

New corporate bonds are sold in one of two ways. Issues are sold in the public market or they are placed directly with particular lenders. Private placements are often made by less highly regarded or less widely known companies. Over the 1953-64 period, about one half of new corporate bond funds was raised through public offerings. Subsequently, the proportion of funds raised through public offerings rose to about two thirds. The decline in private placements reflects the reduced share of life insurance companies in bond acquisitions, since they do most of the purchasing by this method. Apart from the long-term trend, the ratio of publicly offered to total corporate bond borrowing moves up and down with the business cycle. Public utilities are better able to pass on higher borrowing costs to their customers than are industrial firms. So during periods of high and rising interest rates, the volume of publicly offered utility issues remains fairly high while the volume of industrial issues—particularly those of weaker firms that are generally placed privately—is cut back because of the increase in borrowing costs.

During the 1920's, most public issues were handled by commercial banks. There was much concern that commercial bank underwriting and dealing in corporate securities increased financial instability, concentrated economic power, and led to conflicts of interest for banks. Therefore, bank underwriting of corporate bond issues was terminated in 1933 by passage of the Glass-Steagall Act. This legislation was passed during an era in which several important measures affecting financial markets were enacted, including the bill that created the Securities and Exchange Commission (SEC).

Since Glass-Steagall, investment banking firms have been the major underwriters of corporate bond issues. As underwriters, investment bankers purchase an issue themselves or guarantee the issuer a specific price for the bonds. Investment bankers thus bear the risk of gain or loss when the bonds are sold in the open market In some cases, bonds are sold through competitive bidding to the particular underwriter that offers the issuer the highest price for the bonds, which of course means the lowest interest cost to the issuer. The winning underwriter then sells the bonds to the public at a price calculated to cover all costs and to provide an adequate return on the capital funds tied up in the transaction.

A large issue requires the participation of many investment banking firms, who combine under the leadership of a particular underwriter or group of underwriters to form a syndicate. The syndicate leaders must have good information about the marketability of an issue to bid aggressively for it. This information is difficult and costly to obtain if the leaders do not have close contact with the retail market. Because of the importance of accurate information about retail demand in order to bid successfully for an issue, underwriters have a strong incentive to be involved in the final sale of the bonds to retail customers. Accordingly, some large underwriting firms have recently merged with retail brokerage firms, and a number of large retail firms have increased their underwriting activities.

Many corporations maintain long-term relationships with a single underwriting firm and negotiate all of their offerings with it to encourage the underwriter to make a strong effort to sell the company's issues. The designated underwriter—who may organize a syndicate —will typically advise the corporation about the maturities, coupons, and other terms in order to attract the strongest market interest. The choice between competitive and negotiated public offerings is usually determined by the issuer's assessment of whether the benefits of competition for the issue among several groups would be offset by the increased commitment and advice of a particular underwriter. The decision may depend on how well the borrowing firm is known and how specific its borrowing needs are with regard to maturities and other terms. However, many issuers subject to regulatory authorities, such as public utilities, are required to sell their bonds through competitive bidding. In periods of high and rising rates, such as 1974, these authorities sometimes waive this requirement because of concern that strong bids will not be forthcoming.

For both negotiated and competitive offerings, the

The Characteristics of Corporate Bonds

A bond is a debt contract which promises its holder an amount equal to the bond's par value on a stated maturity date as well as specific interest payments at fixed intervals prior to maturity. Holders of corporate bonds that are "unsubordinated" or "senior" debt have a prior claim (relative to holders of equity and "subordinated" or "junior" debt) against the issuer's income, whether generated through normal operations or through liquidation. The payments of some corporate bonds, generally called mortgage bonds, are also secured by liens on particular assets of the issuer. Corporate bonds that are unsecured by specific properties are referred to as debentures Over the years, investors have lowered their evaluation of mortgage bonds relative to debentures Many railroad bankruptcies have shown that a mortgage on a property is of little value unless the property produces a good flow of income. Debentures, on the other hand, have come to be very acceptable when issued by companies with good earning power. While many utilities continue to offer mortgage bonds, large and well-regarded industrial firms typically use debenture financing to avoid encumbering fixed property with liens

Almost all bonds, whether based on a mortgage or on the general earning power of the issuing corporation, have their terms spelled out in a detailed contract called an indenture. This agreement describes the rights and obligations of both parties, mainly the rights of lenders and the obligations of the debtor. The enforcement of this indenture is usually left to a trustee who acts for the bondholders collectively. The terms of the agreement are described in the Trust Indenture Act of 1939

To insure that bond liabilities do not exceed the value of assets financed by these liabilities, corporate bonds usually are issued with sinking fund provisions. The schedule of sinking fund payments is directly related to the estimated depreciation of the assets financed by the bonds. These provisions also name a trustee, frequently a commercial bank, who insures that funds are set aside by the issuer in a reserve account or sinking fund The funds placed in the sinking fund generally are used to retire a portion of the outstanding bonds, and that portion of bonds scheduled for retirement can be retired or called by the trustee on behalf of the issuer, at par, even if market yields have fallen and the price of the bonds has risen above par. Most sinking fund arrangements permit the trustee to "double" or to call at par twice as many bonds as are scheduled for retirement in any particular year under the sinking fund provisions. However, this ability to double cannot be carried over and cumulated but applies only on a year-to-year basis.

For most utility bonds, the sinking fund requirement has until recently been met by applying some minimum percentage of revenues to capital improvements or to the maintenance of the assets financed by the bonds In recent years, however, as the sharp cost increases in energy and raw materials were passed on in price increases and as maintenance expenditures declined as a percentage of total revenues, a part of the sinking fund requirements of utilities, as well as industrials, has been met by the retirement of a portion of outstanding bonds.

In addition to the call of bonds before maturity through sinking fund provisions, special call or "refunding" provisions have been introduced into most corporate bond issues during the past decade. These refunding provisions provide issuers an opportunity, otherwise precluded by the protection of investors against refunding, to retire bonds before maturity with funds obtained by issuing other securities at a lower rate. Refundability generally occurs after five years for utility bonds and after ten years for industrial issues, frequently at a price of 5 to 10 percent above par Since bonds with refunding provisions will be called only if interest rates decline, the initial investors require a higher yield when purchasing securities that include refunding provisions Issuers have been increasingly willing to offer the higher yields necessary to obtain these provisions on account of the greater uncertainty about future interest rates and capital costs due to high and variable rates of inflation.

The length of bonds, or the average period that principal is outstanding, is reduced by sinking fund or other provisions to call bonds before the final maturity date. The increased use of refunding provisions, which introduce a probability that the entire principal will be repaid before maturity, has shortened the expected length of most recently issued corporate bonds The length of bonds may be shortened further if the increased uncertainty about future taxes makes investors as well as issuers more reluctant to commit themselves over a long period. Apart from a shortening of the length of bonds because of either call provisions or earlier final maturity dates, the length of most recently issued bonds—when the average timing of all payments, interest and principal, is taken into account—has been shortened as higher market rates in recent years have resulted in higher coupon rates. The investor recoups a given proportion of the purchase price of recently issued bonds with their higher coupons earlier than on bonds with similar terms to maturity issued, say, in the mid-1960's.

underwriter normally seeks to obtain commitments from potential buyers prior to obtaining them from the issuer. The retail purchasers will have had an opportunity to review a prospectus on the issue, prepared according to the regulations of the SEC, as well as a more detailed registration statement that must be filed with the Commission.[1] Since the actual price of the issue is not set by the syndicate until the syndicate takes ownership of the bonds, the prospectus is in "red herring" form, *i.e.,* some red printing is substituted for final prices and other details that are not known until receipt from the issuer.

Upon receipt of the bonds from the issuer, the underwriting syndicate announces the sale of bonds by advertisement at a price reached by mutual agreement within the syndicate. Because of the prior arrangements with customers, usually most of the bonds have been sold before this announcement, particularly in the case of negotiated issues. In cases where the price set by the syndicate on the bonds is too high, the syndicate will sometimes be forced to disband. The price of the unsold bonds will then be sold by individual members of the syndicate at prices determined by the market rather than by the initial agreement of the syndicate.

The underwriter hopes that the price of the bonds will rise by a small amount after the sale so as to satisfy the investors that they have gotten a good buy. However, too large a premium may cause issuers to believe that the interest rates they have agreed to pay are too high. On many high-quality industrial issues, the flotation cost or the spread between the public price of the bonds and the proceeds to the issuer is ⅞ percent. An underwriting commission of .2 percent is shared on a pro rata basis by all members of the underwriting syndicate, while the managers receive an additional fee of .175 percent. The remaining ½ percent, or $5 per $1,000 bond, is typically paid out as a selling "concession" to salesmen. On utility issues, the total spread is usually between .45 percent and .75 percent. The lower underwriting spread on utility issues is due to their greater marketability In the case of both industrial and utility issues, the total underwriting spread does not include other flotation costs, such as legal, printing, and other costs necessary to satisfy the registration requirement of the SEC, which can run from about 1 percent of total proceeds for issues of under $10 million to about ¼ percent for issues over $100 million.

The most consistent purchasers of corporate bonds through private placement are life insurance companies, who frequently purchase the bonds of small, lesser known companies. This method of placement saves the borrowers most of the marketing costs of a public issue, including the costs of registration with the SEC. More importantly, private placement allows these small borrowers, whose financing needs are often unusual or specialized, to sell issues that probably would meet with a poor reception in the public market. In private placements, highly complex indentures or contracts (see box) can be included to aid the issuer and to protect the investor Companies unable to enter the public market because the quality of their obligations is inadequate to attract large-scale public interest pay a substantially higher rate than do public offerers, and they typically agree not to redeem their securities prior to maturity The terms usually allow some prepayment of principal through retained earnings, though often with severe penalties. Prepayment to refinance at lower rates is generally prohibited.

Risk and corporate bond yields

The yields on particular bonds are partly determined by default and marketability risk Default, or business risk, refers to the risk that payments guaranteed in the bond contract will not be made. This is not a measurable quantity, and qualitative factors—such as the quality and experience of management, the competitive position of a firm within its industry and the prospects for the industry as a whole—affect assessments of default risk. A number of quantitative financial variables, including financial leverage (the ratio of debt to total capitalization), operating leverage (the ratio of fixed to variable operating costs), and the variability of revenues, also affect default risk. Corporations that borrow sizable amounts through public offerings frequently pay one or both of the major rating agencies —Moody's or Standard & Poor's—to rate their bonds with respect to default risk. In the publication of bond ratings, the convention is that a rating by Moody's (Aaa, for example) precedes one by Standard & Poor's (AAA), *viz.,* Aaa/AAA. The agencies' rating categories differ somewhat, but in general the meaning of their ratings is similar. The first four categories—Aaa/AAA through Baa/BBB—are all of "investment grade", meaning that interest and principal are considered secure The Baa/BBB category is said by Moody's to have some "speculative characteristics", while Standard & Poor's terms such issues as on the "borderline" between sound obligations and speculations. Ba/BB issues are far more speculative and B/Bs are even riskier. Moody's then continues through Caa, Ca, and C for highly speculative issues, some of which are in default. Standard & Poor's goes down as far as

[1] Issues of a number of firms regulated by the Interstate Commerce Commission are exempt from registration with the SEC

Table 3

Ratings of Corporate Bonds and Selected Financial Ratios

Rating*	Ratio of earnings to interest plus sinking fund obligations	Ratio of cash flow to senior debt (percent)	Ratio of long-term debt to total capitalization (percent)
Aaa/AAA	At least 5	Above 65	Below 25
Aa/AA	At least 4	45 to 65	Below 30
A/A	At least 3	35 to 45	Below 35
Baa/BBB	At least 2½	25 to 35	Below 40

* In the publication of bond ratings, the convention is that the Moody's rating comes first and Standard & Poor's uses capital letters exclusively

Source Irwin Ross, "Higher Stakes in the Bond Rating Game", *Fortune* (April 1976), page 136

DDD, DD, and D, all of which are for bonds in default but with differences in relative salvage value.

Neither Moody's nor Standard & Poor's publishes information about the actual quantitative measures they use in their evaluations. However, variations in the financial condition of companies whose issues are rated by the agencies tend to be related to the ratings they receive, as summarized in Table 3. The rating of issues is also influenced, of course, by a number of qualitative factors affecting the outlook of individual firms. In the postwar period, no industrial or utility issue has gone into default while rated "investment grade". However, several investment-grade railroad issues went into default in the Penn Central and other railroad bankruptcies. During the Depression, 11 percent (in dollar volume) of investment-grade issues went into default.

Almost all newly issued and rated bonds carry ratings of Baa/BBB or above. Of the 1970-76 dollar volume of corporate bond offerings rated Baa or above by Moody's, about one third carried their Aaa rating, while about 30 percent were rated Aa, another 30 percent rated A, and about 7 percent rated Baa. About two thirds of the dollar volume of bonds in these four highest rating categories were issued by utilities, and industrial offerings accounted for the rest. In the Aaa category, more than 75 percent of the dollar volume was offered by utilities, and telephone bonds accounted for the bulk.

The marketability risk of an issue concerns the possibility that, if a holder wants to sell that issue, his inability to find a buyer may force him to take a loss unrelated to any deterioration in the corporation's financial position. Marketability (or liquidity) depends on the breadth of ownership of a corporation's securities—and frequently on how many securities are outstanding. The presence of a large number of potential purchasers and sellers causes dealers to become willing to buy and sell them and thus to make a secondary market. The default risk of a bond also affects marketability, insofar as issues with low ratings do not attract a wide variety of buyers.

The liquidity or marketability of corporate issues is reflected in the difference—or spread—between the bid and offered prices that dealers quote (for certain minimum amounts of bonds) when they make a market in an issue. The dealer spread in a $500,000 to $1 million transaction for a highly marketable corporate bond is typically about ⅛ point. Spreads for less marketable issues range from about ¼ point to ½ point. (The smallest spreads in the bond market are for actively traded Government securities, and these range from 1/32 point to 1/16 point.)

Since trading is generally more active immediately after new issues are brought to the market, new issues are typically quoted at narrower spreads than issues that are firmly held in investors' portfolios. The amount of uncertainty about future interest rates may also affect spreads. An increase in the degree of uncertainty or in the expected variability of rates will cause spreads to widen.

Substitution in the corporate bond market

The amount of corporate bonds on the balance sheets of both issuers and purchasers of corporates reflects a variety of portfolio constraints. For example, because of the pattern of their inflows and outflows, pension funds and life insurance companies are generally limited to long-term investments On the issuer side, corporations tend to match the maturities of their liabilities with those of their assets. Nevertheless, these constraints typically permit some substitution or alteration in the bond portions of both issuer and purchaser balance sheets in response to changes in relative yields and other factors.

Bonds are issued by corporations to finance the acquisition of assets. It is convenient to look at the corporate financing process, first, as a decision about the distribution of total financing between debt and equity and, second, as a decision about the distribution of debt financing between bonds and short-term debt obligations. A number of factors affect corporations' choice between debt and equity financing, including the levels of corporate and personal income tax rates, the rate of inflation, and the level of corporations' asset risk, *i.e.*, the amount of uncertainty or expected variability of their earnings before interest and taxes.

The current tax system favors debt financing by corporations, because interest payments made by corporations are deductible from their taxable income while any dividend payments they make are not. However, the ownership of corporations resides in a collection of individuals, and the tax advantage of debt financing accruing to the owners of corporations because of taxation at the corporate level may be offset in the taxation of the owners' personal incomes This offset may occur because interest and dividend income to the owners is taxed at the ordinary personal income tax rate, while income in the form of capital gains is taxed at half the personal tax rate—up to a maximum rate of 25 percent. The tax benefits to corporations from debt financing exceed those from equity financing except when securities are held by the small number of individuals whose personal tax rates are very high relative to the corporate tax rate.

Inflation also encourages corporations to favor debt relative to equity financing if the real or inflation-adjusted cost of borrowing declines. The effects of inflation on the real costs of financing are discussed in the opening article in this *Review*.

While the tax structure and inflation encourage firms to use debt rather than equity financing, the greater use of debt increases a firm's fixed commitments. In the case of debt financing—given the amount of asset risk—the resulting rise in fixed commitments increases the risk of bankruptcy, and bankruptcy creates two general categories of costs. The first category—direct costs—includes lawyers' and accountants' fees, other professional fees, and the value of the managerial time spent in administering the bankruptcy. Evidence in the bankruptcies of eleven large railroad firms between 1930 and 1955 suggests that these costs were small relative to the value of the firms. However, the second category—indirect costs—may be much larger. These costs include lost sales, lost profits, and possibly the inability of firms to obtain credit or to issue securities except under especially onerous terms. Unless the direct and indirect costs of bankruptcy are negligible, debt financing or any other factor increasing the probability of bankruptcy may be expected to increase a firm's cost of financing or the yield required by holders of the firm's securities. The positive relation of asset risk—and the greater possibility of bankruptcy as more debt is issued—to the cost of debt relative to equity financing explains why public utilities and other firms with low asset risk maintain high debt ratios while firms with higher asset risk limit their use of financial leverage.

The inverse relation between the asset risk of individual firms and the debt ratios of the same firms should also apply over time for the corporate sector as a whole. An increase in asset risk for the corporate sector—because of an increase in the general amount of fluctuation or instability in the economy—should cause firms to reduce their debt ratios and their fixed commitments in order to reduce the risk of bankruptcy.

From 1948 through the 1950's, the debt portion of the financing of nonfinancial corporations remained stable. Subsequently, from 1960 to 1974, the ratio of debt to total financing or total assets underwent a steady and sizable increase (Chart 1).[2] When the balance sheet is expressed in terms of historical costs, the ratio rose from .47 in 1960 to .50 in 1967 to an average of .55 during the 1972-74 period. However, the ratio of debt to assets tends to be overstated during periods of inflation. During inflationary periods, the historical costs of physical assets as reported in balance sheets fall below the current value or replacement costs of these assets. There is no corresponding understatement of debt, because inflation does not increase the value of liabilities which represent dollars not physical units.[3] When the historical costs of physical assets are replaced by the current or replacement costs of assets, the debt ratio rose from .40 in 1960 to .44 in 1967 to an average of .47 over the 1972-74 period. In 1975, the debt ratio experienced its first decline in fifteen years, as firms reduced their short-term debt. Because some of the short-term debt was replaced by bonds as well as equity, the bond proportion of total financing increased slightly during this period.[4]

The rising debt ratios in 1960-74 should be separated into two roughly equal subperiods because of the different factors affecting debt ratios in each. Inflation

[2] In the article on pages 1-10, market values of debt and equity are analyzed Here, book rather than market values of debt and equity are used The purpose is to examine the financing decisions of corporations, and market values reflect not only financing decisions but also unexpected changes in the value of securities in the market

[3] During inflationary periods, the par value of debt in balance sheets overstates the market value of that portion of debt issued with low coupons before the rise in nominal interest rates Since virtually all short-term debt and most long-term debt now outstanding have been issued in the period of high interest rates that began in about 1970, the degree of overstatement of total corporate debt by using par values is small

[4] To determine the financial condition of a firm, it is necessary to value assets and liabilities in terms of current rather than historical costs This valuation adds to physical assets, as reported in balance sheets, the capital gains on physical assets because of inflation The increase in value on the asset side of the balance sheet implies an equivalent increase in net worth and may tend to suggest that these gains are part of the firm's income However, as noted in the article on page 2 of this *Review*, these gains from inflation are necessary to maintain a given level of claims on resources and should not be added to the income from normal or continuing operations in the measurement of a firm's income performance, even though the cumulation of these gains must be incorporated in the balance sheet to obtain an up-to-date description of the firm's financial condition

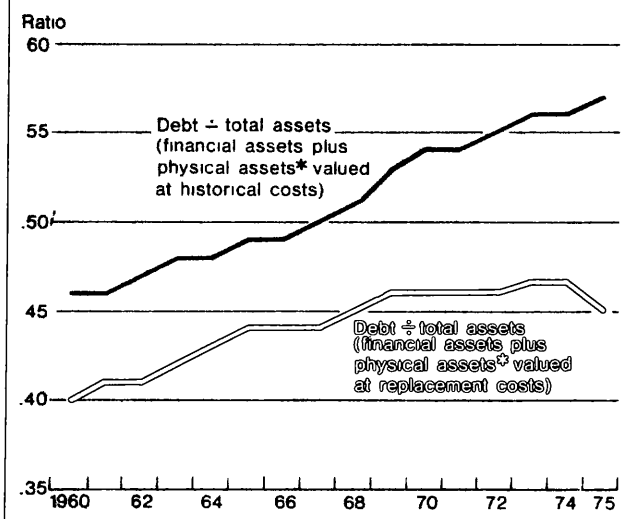
remained fairly moderate until 1968 except for brief inflation episodes in the late 1940's and during the Korean war. The corporate tax burden declined slightly during the early and mid-1960's because of the investment tax credit. This behavior of inflation and the tax burden suggests that the increase in debt ratios from 1960 through 1967—after fifteen years of little change—occurred because of a decrease in asset risk rather than an increase in taxes or inflation. The decrease in asset risk after 1960—or the perception that it was higher before 1960—may reflect a dimming of early postwar memories of the Great Depression during the 1930's. In contrast to the early and mid-1960's, inflation rates from 1968 on were substantially higher than during most of the 1940's and 1950's. The increase in debt ratios after 1967 seems to have resulted from this increase in inflation and a decline in the inflation-adjusted cost of debt financing.

The decrease in debt ratios during 1975 was related to the decline in short-term debt as inventories were liquidated; the moderation of inflation may also have contributed. The decline also may reflect the perceptions of both issuers and investors that corporation asset risk had increased. An increase in asset risk beginning in the mid-1960's is suggested by the deviations of corporate profits from their long-term trend, as depicted in Chart 2. Larger deviations from trend occurred in the 1965-75 period than in the 1948-65 period, even if the 1965-75 deviations are divided by the larger values of profits in the later years. The relatively and absolutely larger deviations in the 1965-75 period indicate a higher level of profit variability—a close proxy for asset risk.

Choosing between short- and long-term debt financing is much more closely related to the business cycle and the behavior of interest rates, including short-term rates, than is the choice between debt and equity financing. During 1960-76, the ratio of long-term debt to total debt maintained a consistent and inverse relation with short-term rates (Chart 3). At least part of the decline in bond financing relative to short-term debt financing during periods of rising short-term rates presumably reflects large increases in inventories, which firms typically finance with short-term debt. However, the relative decline in bond financing during these intervals may also have reflected firms' efforts to substitute between short-term and long-term debt in order to reduce financing costs. This happened despite high short-term rates, both in absolute terms and rela-

Chart 1

Two Measures of the Corporate Debt Ratio

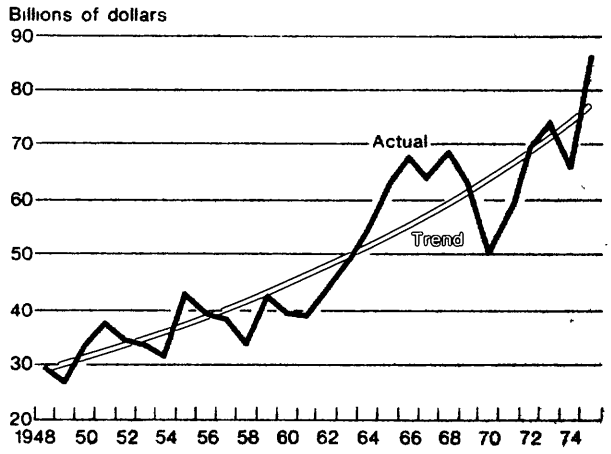


*Physical assets consist of inventories and of fixed assets (depreciated on a straight-line basis)

Sources Physical assets valued at historical costs and at replacement costs from the Department of Commerce, financial assets and debt from the Board of Governors of the Federal Reserve System

Chart 2

Comparison of Actual Profits with Long-term Trend of Profits*



*Profits include inventory valuation adjustment This adjustment subtracts profits that result from pricing the inventory used up in production at historical costs rather than replacement costs

Sources. Department of Commerce; trend line for profits computed by the author

tive to long term rates. Firms may have used short-term rather than long-term financing because they expected a decline in both short- and long-term rates and they wanted to defer long-term financing until the decline in rates had occurred. Bond financing then increased relative to total debt financing, as inventories were liquidated and firms took advantage of declines in long-term rates to issue long-term debt.

Substitution by investors

The degree of substitution between corporate bonds and other instruments differs substantially among the major groups of holders. Households substitute freely among corporate bonds, equities, and short-term securities. During the 1920's, households owned about two thirds of the corporate bonds outstanding. After World War II, their holdings dropped sharply while their investments in equities rose substantially. As bond yields increased in the 1960's and the performance of equity investments worsened, households again became large holders of corporate bonds.

Although life insurance companies have in recent years been devoting somewhat less of their investments to obligations with very long maturities, their unique time pattern of inflows and outflows inevitably reduces their ability to substitute between corporate bonds and other instruments, particularly short-term securities. Pension funds also tend to hold most of their assets in long-term investments. The principal difference between pension funds and other corporate bondholders, however, is that all forms of investment income of pension funds are free of Federal income taxes. Since households are taxed more heavily on investment income than on capital gains and income from municipal bonds, household investment as compared with pension fund investment is more heavily concentrated in municipal bonds and growth-oriented equity issues. Pension funds invest more heavily in corporate bonds and income-oriented equity issues.

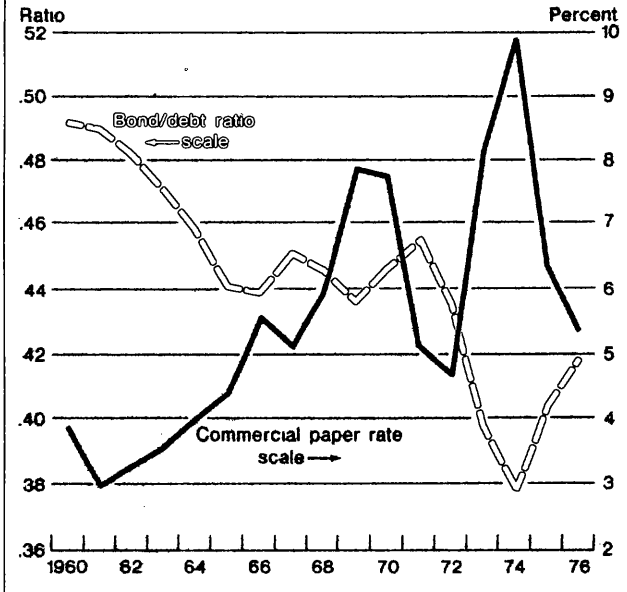
Although the differences in the tax status of households and pension funds cause their relative holdings of various financial instruments to differ, these differences do not reduce their incentive or ability to substitute between different instruments in order to maximize the aftertax return on their investment portfolio. Both households and pension funds—life insurance companies do so to a lesser degree—substitute between assets on the basis of alternative aftertax yields, and this substitution does not exclude assets that are typically held by others.

There is considerable evidence that suggests such substitution by financial market participants over a wide range of financial assets including corporate bonds Also indicative of extensive substitution is the broad similarity of interest rate movements over the 1960-76 period, as illustrated in Chart 4. Yields on corporate and government bonds moved very similarly over these years. And, although yields on commercial paper fluctuate much more than those on corporate bonds, the yields on commercial paper and corporate bonds also tended to behave alike. Parallel movements of corporate bond and stock yields also took place, though the parallelism in yield patterns of these yields was somewhat less than in the other comparisons.

Apart from the different cash flow patterns of various financial market participants, the volume and the distribution of corporate bond holdings in the economy reflect a variety of public policies. In the area of taxation, these policies include the differential treatment of interest and dividend payments in the taxation of corporate income, the differential treatment of capital gains and other investment income in the taxation of personal income, and the exemption of pension funds from taxes on all of their investment income. Statutory factors, such as prohibiting commercial banks from underwriting corporate bonds, also affect the pattern of ownership and the marketing of these bonds. However, the extensive substitution between corporate

Chart 3

Ratio of Bonds to Total Debt* of Nonfinancial Corporations, Compared with Commercial Paper Rate



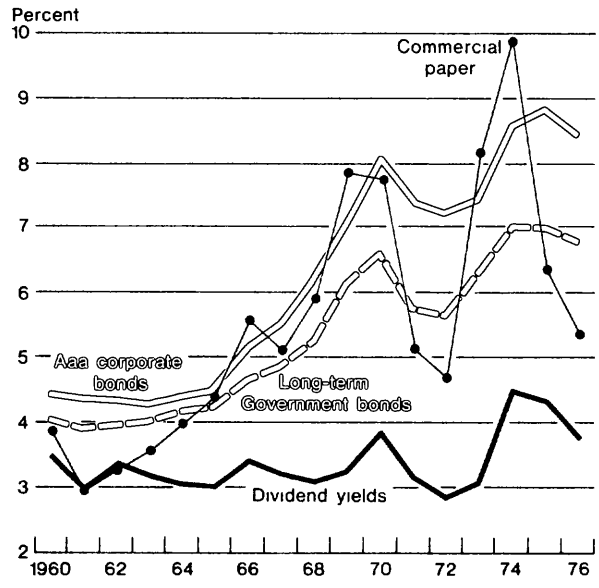
*Excludes mainly accrued tax liabilities and trade debt.

Source: Board of Governors of the Federal Reserve System

Chart 4

Rates in the Financial Markets

Annual averages



Source Board of Governors of the Federal Reserve System

bonds and other financial instruments—by both issuers and purchasers of corporate bonds—tends to offset a part of the effects of these tax and statutory factors on the volume and distribution of corporate bond holdings. As tax and statutory factors alter the supply or the demand for corporate bonds in the market and cause prices on these bonds to change, market participants purchase corporate bonds if the new price is lower and sell them if the new price is higher. Although the substitution between assets does not reverse the desired effect of the policy on the market, the substitution does reduce the size of the effect.

Similarly, substitution between corporate bonds and other investments weakens the effects of public policies designed to alter the demand or supply of securities that are substitutes for corporate bonds. For example, the most comprehensive attempt to alter the supply of securities in a financial market has been the variety of policies designed to increase the supply or availability of mortgages in order to sustain housing expenditures. These policies include interest rate ceilings on deposits to protect mortgage lending institutions from excessive competition for funds and the creation of Federal Government agencies to raise funds in the capital markets for reinvestment in mortgages. The impact of those policies on the mortgage market was partly offset as other mortgage holders have responded to the increased purchase of mortgages by Federal agencies and mortgage lending institutions by selling mortgages and purchasing other assets. The other assets include corporate bonds, since mortgages and corporate bonds are substitutes in the portfolios of mutual savings banks, households, life insurance companies, and other investment groups. Perhaps more importantly, the moderate increase in the supply of mortgage credit that did result from selective credit policies in the mortgage market caused an even smaller reduction in yields on mortgages. Mortgage yields changed very little because the total demand for mortgage credit increased as households substituted mortgage credit for other credit in their financing of both housing and nonhousing expenditures.

This example of substitution illustrates the difficulty policymakers may have in attempting to alter supplies in particular financial markets. Financial assets are fungible, and investors in a relatively free market move their funds from one market to another on the basis of relative yields. Indeed, substitution because of yield or cost differentials—an increase in corporate bond purchases by households and pension funds on the investor side and an increase in debt financing relative to equity financing on the issuer side—has accounted for the major changes in the corporate bond market over the past fifteen years. As investors and issuers of securities shift between securities and markets on the basis of relative yields, policies to steer financing into particular channels will be offset even if elaborate measures are taken to do so.

Burton Zwick