

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The Changing Roles of Debt and Equity in Financing U.S. Capital Formation

Volume Author/Editor: Benjamin M. Friedman, ed.

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-26342-8

Volume URL: <http://www.nber.org/books/frie82-1>

Publication Date: 1982

Chapter Title: Introduction, An Overview of the NBER's Research Project on The Changing Roles Debt and Equity in Financing U.S. Capital Formation

Chapter Author: Benjamin M. Friedman

Chapter URL: <http://www.nber.org/chapters/c11391>

Chapter pages in book: (p. 1 - 14)

Introduction: An Overview of the NBER's Research Project on The Changing Roles of Debt and Equity in Financing U.S. Capital Formation

Benjamin M. Friedman

With the approach of the 1980s, the National Bureau of Economic Research identified the issue of capital formation as a primary target for empirical economic research. Several considerations made this choice a sensible one. Economic thinking has nearly always emphasized the central role of fixed capital in the physical production process. In addition, the evolution of public policy discussion in the United States during the 1970s had made clear that economists and business leaders were not alone in calling for an increased rate of capital formation. What may once have been an esoteric subject had emerged as a widely supported national objective. Finally—and most importantly, from the National Bureau's perspective—the nature of many of the important questions involved in the capital formation issue suggested the potential ability of serious empirical economic research to increase basic understanding.

Within the National Bureau's overall research effort, questions about capital formation also seemed to represent a natural direction for the Financial Markets and Monetary Economics program. In an advanced economy like that of the United States, with highly developed financial markets, capital formation represents not just the allocation of physical resources but the allocation of financial resources as well. Every physical investment decision has its financial counterpart. Moreover, a large body of evidence indicates that these financial allocations do not simply mirror corresponding physical allocations that would take place in any case. The financial and the physical aspects of businesses' and individuals' decisions in this area are fully interdependent, so that the surrounding financial environment importantly affects both the amount and the composition of the capital formation that the economy as a whole undertakes.

Indeed, financial influences on capital formation in the American economy are so many and so pervasive that some more specific focus was

necessary for even a major research project. In this context the respective roles of debt and equity in financing capital formation stood out as being of particular interest, at least in part because these roles not only appear to have been undergoing some change but also seem likely to evolve further in the future. Hence the choice of specific subject: *The Changing Roles of Debt and Equity in Financing U.S. Capital Formation*.

The starting point for this research effort was a pair of broad questions about the markets in which the debt and equity securities of business corporations undertaking physical capital formation are issued, traded, and priced. First, how have the markets priced corporate debt and equity securities in the past, and what aspects of the markets' functioning have accounted for these evaluations? Second, how have corporations' financing patterns responded in this environment, and what specific aspects of the interaction between the market mechanism and corporate financing decisions have accounted for these responses? Fourteen papers addressing these questions, written by eighteen National Bureau researchers, constituted the first major stage of the project.

The papers in this volume are the authors' summaries of six of these fourteen papers. These six papers were prepared for a conference that the National Bureau sponsored at Williamsburg, Va. on 2-3 April 1981. The conference provided an opportunity to report on this research to, and receive valuable feedback from, an audience consisting of financial market practitioners representing investment management firms, insurance companies, commercial banks, and investment banking firms, as well as financial officers of corporations in nonfinancial lines of business. The six papers presented at that conference, and published here for the first time, provide a balanced overview of the first major stage of this research project, which is now complete.

How Have the Markets Priced Corporate Debt and Equity Securities?

The majority of the papers prepared during the first stage of the research project adopted a market perspective. Two of these papers examined the historical experience directly. Three focused on the core of the market mechanism consisting of the relationships connecting expectations, risk, and market prices. Four additional papers addressed specific questions including inflation risk, the interaction between inflation and market regulation, effects of federal debt management policy, and the increasing internationalization of the U.S. financial markets.

Patric H. Hendershott, in his paper "Inflation, Resource Utilization, and Debt and Equity Returns," reviewed the basic pricing experience in the U.S. debt and equity markets during the past half-century. More specifically, Hendershott investigated the relationships among Treasury bill rates, the realized returns on Treasury bonds and bills, and the

realized returns on equities and corporate bonds, in the context of variations in price inflation as well as the business cycle. His analysis therefore provided a background for considering the fundamental portfolio decision concerning the broad division of investable funds among equities, long-term debt, and short-term debt.

Hendershott's analysis documented three separate findings. First, the experience of real and nominal returns on Treasury bills since the 1951 Treasury-Federal Reserve Accord has differed sharply from the corresponding pre-Accord patterns. In earlier years nominal bill yields were reasonably stable and real yields extremely volatile, while more recently the nominal bill rate has cycled around a rising trend and real rates have stayed near zero. Second, unanticipated changes in bond coupon yields have dominated the relative return relationship between bonds and Treasury bills. Because bond coupon rates have risen with (unexpected) inflation during the past fifteen years, bonds have earned negative real returns. Third, the relative return relationship between bonds and equities has varied systematically over the business cycle, with equities earning large positive relative returns around business cycle troughs and large negative relative returns around peaks.

Hendershott's paper, which appears as Chapter 1 of this volume, is an introduction to a more comprehensive study which will be part of the second stage of this overall research project.

William C. Brainard, John B. Shoven, and Lawrence Weiss, in their paper "The Financial Valuation of the Return to Capital" (*Brookings Papers on Economic Activity* No. 2, 1980), also examined the market's valuation of equities and other claims to corporate capital. They used cross-section data on the valuation of a sample of U.S. firms at different times to estimate the time-discount and risk-adjustment factors necessary to explain the observed market values for these firms during the twenty years 1958-77. Cross-sectional variation in the relevant measures of the riskiness of earnings streams having the same time profile of expected returns provided the means by which they could distinguish separate time-discount and risk-adjustment factors.

The method used by Brainard, et al., to calculate the present discounted value of future cash flows for each firm in each year involved first calculating the age structure, replacement value, and rate of return of the firm's capital stock. They then computed aggregate series of gross and net returns. Finally, to explore the sensitivity of their results to variations in assumptions about expectation formation, they used ten different methods of forecasting future earnings.

The results of this analysis confirmed a large decline in market values relative to the present values of after-tax cash flows, discounted by either a constant real rate or an inflation-adjusted bond rate. Specifically, the real discount rate required to equate market and present discounted

values increased from less than five percent in the late 1960s to more than ten percent on average in the late 1970s. Moreover, these results did not depend on a particular, perhaps overly optimistic, assumption about expected future earnings. The sharp decline in firms' market values relative to present values of the corresponding streams emerged even with the most pessimistic of the ten earnings expectations models, which assumed a continuation of the historically low rates of return experienced in the latter part of the sample period.

Brainard, et al., also briefly considered four familiar factors sometimes hypothesized to account for this decline in valuation: increased investor aversion to risk; an increased tax burden on corporate earnings due to price inflation; investors' inability to assess earnings streams correctly because of inflation; and an overall decrease in expected rates of return due to higher energy prices and/or increased government regulation. The results along these lines were mixed at best. In the end the authors concluded that the combination of measurable characteristics of firms and conventional methods of projecting and discounting future earnings is not likely to explain the decline in market values that dominated the 1970s.

Robert C. Merton, in his paper "On Estimating the Expected Return on the Market: An Exploratory Investigation" (*Journal of Financial Economics*, December 1980), examined a series of issues relating to the measurement of expected returns assessed against their riskiness in the equity market. The expected return on "the market" is a concept often central to problems in both portfolio management and corporate finance. For example, to implement even the most passive investment strategy, an investor must have some idea of the expected return on the market in order to determine how much of his portfolio to allocate to a fully diversified mix of equity holdings. Similarly, the expected equity return is an important element in determining "hurdle rates" for capital budgeting, or the allowed "fair" rate of return in regulated industries.

The conventional way to estimate this expected return, at least for purposes of economic research, is to adjust the prevailing return on some "safe" alternative to equities—say, a short-term interest rate—according to the historical average difference by which equity returns have exceeded this alternative. This procedure does, of course, explicitly reflect the dependence of the expected equity return on prevailing interest rates. By contrast, it does not take into account the effect of changes in the level of risk associated with equities, or changes in investors' attitudes toward that risk. It is clear that the dependence of expected return on risk in this context could matter in principle. Merton's object was to evaluate whether in fact it matters importantly in practice.

Merton addressed this question by analyzing the implications of three models of securities pricing that explicitly reflect the dependence of the

expected equity return on changing risk. In each case he derived a set of procedures for estimating the expected return on the market that incorporated the underlying pricing model, as well as the constraint that, as a consequence of risk aversion, the expected return on the market must exceed the return on riskless assets. Merton then estimated each of these three models using U.S. data for 1926–78.

The chief conclusion from this analysis was that the presence or absence of risk dependence, and its specific form if present, are both quantitatively important for the estimation of the expected market return. In other words, because the average variability of the realized market return changes significantly over time, it is important to allow for changes in the variability associated with expected market returns when predicting the expected return in the market in excess of “safe” alternatives.

Robert J. Shiller, in his paper “Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?” (*American Economic Review*, June 1981) examined from a different perspective the same question of the variability of equity prices and returns. The particular focus of Shiller’s investigation was the combination of the “dividend discount” relationship between equity prices and expected future dividends and the “efficient markets” principle that investors exploit all available information in anticipating the future. More specifically, the dividend discount model, stated in inflation-adjusted terms, asserts that real equity prices equal the real values of expected future real dividends discounted by the appropriate real interest rate; a particular version of this model, which has found substantial acceptance in practice, further assumes that the relevant real interest rate is constant or nearly so. The efficient markets principle in turn asserts that equity prices at any time already incorporate all available information about the future of dividends, so that changes in dividend expectations (and hence in equity prices) reflect only new information as it emerges.

Shiller’s goal was to test the familiar objection that observed equity prices are too volatile to be consistent with a pricing mechanism based on the dividend discount model combined with the efficient markets principle. The point of this objection is simply that observed movements in real equity prices are too large, in comparison with the subsequently experienced movements in real dividends, to be realistically attributed to any objective flow of new information about those dividends. Hence either the dividend discount model or the efficient markets principle (or both) must be inadequate as a characterization of how the market works.

Shiller found that tests based on data for the Standard and Poor’s Composite Stock Price Index since 1870, and for the Dow Jones Industrial Average since 1928, bear out this objection. More specifically, after adjustments for price inflation and a time trend, the observed movements

in equity prices could have been justified as the rational response to new information about expected future dividend movements only if the latter were many times bigger than those actually observed. Alternatively, variation in the (unobserved) real interest rate could have reconciled the observed movements in equity prices and rationally expected future dividend movements only if that variation had been implausibly large. On the basis of these results, Shiller concluded that the combination of the dividend discount model and the efficient markets principle does not provide an adequate description of the equity market's pricing mechanism.

John G. Cragg and Burton G. Malkiel, in their paper "Expectations and the Valuation of Shares" (forthcoming as part of a National Bureau monograph bearing the same title), used data collected from a survey of financial analysts to explore the equity market pricing mechanism. During the 1960s Cragg and Malkiel had obtained estimates of the short- and long-run changes in individual company earnings, together with related financial information, from seventeen major investment firms. Their research had two main objectives: to characterize the surveyed expectations in relation to familiar theories of expectations like those encompassed in the efficient markets principle; and to examine the role of these expectations in the determination of the prices of individual companies' equities.

On the first question, Cragg and Malkiel found that the surveyed expectations failed in a number of ways to conform to the assumptions often made in efficient markets models. On the second question, however, they found that the surveyed expectations did seem to have affected equity prices, both in ways suggested by the familiar theory and in apparently other ways too. In particular, despite the familiar theoretical principle that the market takes account of only systematic (that is, market-related) risk in pricing a security, Cragg and Malkiel found, first, that a variety of systematic factors appear to affect security prices and, second, that specific (that is, market-independent) risk may also affect the price of a company's equities.

Malkiel's paper "Risk and Return: A New Look," which appears as Chapter 2 of this volume, summarizes and extends this work.

Zvi Bodie, in his paper "Innovation for Stable Real Retirement Income" (*Journal of Portfolio Management*, Fall 1980), addressed the problems that price inflation causes for all savers including in particular those saving for their retirement. Bodie showed that conventional U.S. debt and equity financial instruments—including short-term money market instruments, long-term bonds, and equities—have all failed to provide holders with an adequate hedge against inflation during the past twenty-five years. On average, money market instruments have borne a small positive after-inflation return and equities a larger return, while

bonds have borne a negative after-inflation return. The returns on all three kinds of instruments have been highly volatile, however, both before and after inflation.

Bodie focused on finding the most appropriate asset base in the U.S. capital markets for funding price-indexed retirement savings plans. He found that, during the past twenty-five years, the investment strategy offering the least risky after-inflation rate of return would have been to hold money market instruments together with a small position in a well-diversified portfolio of commodity futures contracts. The after-inflation return that such a portfolio would have earned, however, is approximately zero. In more recent work, also done within this overall research project, Bodie has extended this analysis by considering the tradeoff between risk and return facing an investor in the U.S. capital markets who is concerned about after-inflation returns but is not solely interested in minimizing risk. Money market instruments are once again the cornerstone of any low-risk investment strategy, and equities are the main ingredient in any high-return portfolio. Commodity futures contracts are the only asset whose after-inflation return is positively correlated with inflation. Adding them to a portfolio therefore lowers the risk associated with any target after-inflation rate of return.

Bodie's paper "Investment Strategy in an Inflationary Environment," which appears as Chapter 3 of this volume, summarizes and extends this work.

Edward J. Kane, in his paper "Accelerating Inflation and the Distribution of Household Savings Incentives" (in *Stagflation: The Causes, Effects, and Solutions*, U.S. Congress, Joint Economic Committee, December 1980), used cross-section data to show how U.S. households in different economic and demographic classes have reallocated their savings in response to the combination of accelerating inflation and regulated deposit interest rates. On balance, these forces have led households of below-average wealth to shift their savings into tangible assets, especially real estate, and households of above-average wealth to shift their savings into unregulated financial assets. Both responses have increased the riskiness of savers' portfolios.

Kane's analysis showed how, both to hedge inflation risk on their nondiscretionary contractual savings and to eke out a positive net after-tax real return on their discretionary savings, all but the wealthiest U.S. households have found it advantageous to substitute investments in housing and other real estate, as well as consumer durables and collectibles, in place of traditional saving vehicles like deposit accounts and savings bonds. By contrast, as a result of differential taxes and transactions costs, the nation's wealthiest households have moved on balance out of both traditional deposit accounts and home equity into certificates of deposit, marketable bonds, and equity in investment real estate. Given these new

riskier portfolios, less wealthy households have actually fared better than have wealthy households. Real returns earned by wealthy households have been poor, as bond prices have fallen and equity values have failed to keep pace with inflation, while trends in the relative price of housing have rewarded those who shifted heavily into real estate, especially on a highly leveraged basis.

Kane's analysis also revealed several other important trends, including a greatly increased emphasis on leveraged housing investment among young households and an increased concentration of marketable bonds and equities among wealthy households. Households headed by persons under age twenty-five have greatly expanded their equity in houses, although still not enough to lift the overall return on their savings up to the level achieved by older groups. The tendency to buy smaller homes, due to smaller family size as well as restricted financing opportunities, has held down young households' ability to earn comparable rates of return. The increasingly tight concentration of marketable securities in the hands of wealthy investors suggests that only they could economically engage in strictly financial-market disintermediation. It also explains regulators' strategy of relaxing deposit interest ceilings only on minimum-deposit (and longer-maturity) accounts.

These findings served to underscore the unintended consequences of the combination of accelerating inflation and deposit interest ceilings. The ultimate economic effects have been to distort the sectoral composition of saving and risk-bearing in ways likely to crowd out productive business investment, as well as to distort the distributions of income and opportunity.

V. Vance Roley, in his paper "The Effect of Federal Debt Management Policy on Corporate Bond and Equity Yields" (*Quarterly Journal of Economics*, in press), addressed the effect on U.S. debt and equity yields associated not with the government's overall deficit total but with its manner of financing that deficit. In theory, federal debt management policy may play an important role in determining the yield structure of both government and private securities. Previous empirical studies, however, have typically failed to detect quantitatively significant effects of federal debt management. By contrast, using a disaggregated structural model of the markets for government and private securities, Roley found that such effects were important.

The maturity composition of the federal debt has exhibited dramatic changes during the past thirty years. In 1950 the average maturity of the U.S. Treasury's outstanding debt held by private investors was 124 months. The average maturity fell steadily to 58 months in 1960, as the Treasury shifted to a greater reliance on short-term securities. Despite the "Operation Twist" policy of the early 1960s, the average maturity in fact remained stable during 1960-66, but thereafter it declined further to

a low of 29 months in 1975, in large part because of the 4.25 percent interest ceiling on new Treasury bond issues. Beginning in 1975 the Treasury embarked on a policy to lengthen the federal debt, and as a result the average maturity rose to 46 months in 1980.

The impact of debt management policy on corporate debt and equity returns depends in the first instance on the degree of substitutability among government securities of different maturity, and on the substitutability between government securities and private securities, within investors' portfolios. It also depends on the responses of private debt and equity issuers. In one extreme, for example, the ultimate impact of a federal debt management operation could be an unchanged structure of yields together with a significant shift in the composition of corporate financing.

Roley's empirical results indicated that changes in the maturity composition of the federal debt significantly affect the markets for government and private securities, at least in the short run. In particular, the corporate bond yield closely follows the long-term government bond yield, while the equity yield shows smaller movements in the same direction. In the longer run the effects on yields are smaller than the initial impacts, even when the debt composition changes are permanent. In general, the results indicated that lengthening the federal debt reduces incentives for both bond and equity finance by the corporate sector, and vice versa.

David G. Hartman, in his paper "International Effects on the U.S. Capital Market" (NBER Working Paper No. 581), examined changes in the U.S. debt and equity markets due to the tendency toward greater economic interdependence. Hartman's principal finding was that the increasingly larger international capital flows have exerted significant effects on U.S. corporate bond rates. Moreover, since the corporate bond rate and other interest rates closely tied to it are often important determinants of physical investment decisions, this result suggests that international financial capital transactions also affect the U.S. rate of physical capital formation.

Hartman began by documenting the changing nature and magnitude of international transactions in the U.S. capital market. Although not long ago such transactions were small in comparison with the size of the U.S. market, in recent years foreign participation in the U.S. markets for both debt and equity securities has expanded greatly. Foreign investors are now major purchasers of both bonds and equities issued in the United States, and foreign borrowers now account for a significant fraction of all bonds issued in the United States. To date, foreign equity issues have been more limited.

Hartman then developed a model of the determination of the U.S. corporate bond rate that, in contrast to most interest rate models, admit-

ted the possibility of international influences. Empirical evidence indicated that such influences are both significant and sizable.

How Has Corporate Financing Responded?

The remaining papers prepared during the first stage of the project shifted to the corporate perspective, focusing on the responses of corporations' financing to these market influences and on specific factors conditioning that response. One paper, which developed new historical data series from primary sources, examined the corporate financing and corporate balance sheet experience directly. Two papers addressed considerations associated with taxation in determining corporate financing decisions, one in the context of the differential tax treatment of dividends and capital gains, and one in the context of the risk of corporate bankruptcy. Two further papers addressed the rapid development of private pensions and the growth of the public debt through government deficits as specific external factors affecting corporate financing decisions, and highlighted the implications of these developments for U.S. capital formation.

John H. Ciccolo, Jr., in his paper "Changing Balance Sheet Relationships in the U.S. Manufacturing Sector, 1926-77," documented trends in the sources and uses of funds, market valuations, and rates of return for U.S. manufacturing firms during the half-century ending in 1977. The chief objective of Ciccolo's work was to derive economic balance sheet relationships based on market valuations of firms' securities rather than on the more familiar book values used for accounting purposes.

Among the more interesting long-term trends highlighted in Ciccolo's analysis is the finding that the widely recognized increase in debt in manufacturing firms' capitalization has come primarily at the expense of preferred stock. Relative to net assets, the market value of firms' debt plus preferred stock has remained virtually constant. A second interesting point is the contrast between the sharp fall in common equity values in 1929-32, which was entirely reversed by 1936, and the even sharper post-1968 decline which was not reversed even by 1977 (or, for that matter, 1981). Finally, although Ciccolo's work documented the long-term declining trend in dividend payments and the postwar rising trend in interest payments relative to firms' net assets, it showed that whether or not there has been a downward trend in the rate of return on either stockholders' equity or net assets depends largely on the beginning and ending dates chosen for the analysis.

Ciccolo's paper, which appears as Chapter 4 of this volume, is an introduction to a more comprehensive study which will be part of the second stage of this overall research project.

Roger H. Gordon and David F. Bradford, in their paper "Taxation and the Stock Market Valuation of Capital Gains and Dividends: Theory and Empirical Results" (*Journal of Public Economics*, October 1980), addressed the familiar puzzle of why U.S. corporations pay dividends. Because dividends appear to be more heavily taxed than capital gains, corporate shareholders ought to prefer either retained earnings or stock repurchases to dividend payments, all other things being equal. In 1976, however, corporations distributed in dividends \$25 billion of a total \$63 billion of profit net of taxes and interest. Either corporations are not acting in the best interest of their shareholders, or shareholders desire dividends sufficiently for other reasons to offset the tax effect.

Gordon and Bradford approached this question by developing and estimating a model of the relative value of dividends and capital gains in the U.S. equity market. For tax and other reasons, the taxpayer population will exhibit a distribution of differing preferences between returns in the form of dividends and returns in the form of capital gains. Individual corporations' shares will differ in the division of their total return between the two forms, and investors making portfolio decisions will take this division into account along with the corporation's risk structure. The market equilibrium therefore determines a single rate of exchange between dividends and capital gains. Although this exchange rate cannot be observed directly, it can be inferred from market data.

Gordon and Bradford's results indicated that the exchange rate between dividends and capital gains varies cyclically around an average value of approximately unity. In other words, the relative values of dividends and capital gains tend toward equality. These results are unsurprising from the perspective of corporations' choices of dividends versus retentions, but they are inconsistent with the view that shareholders value dividends and capital gains solely for their after-tax cash flow. Possible explanations for this shareholder behavior include the potential role of dividends as a signal of the corporation's future profitability, the existence of a frequently neglected class of shareholders for whom dividends are less heavily taxed than capital gains, or even an irrational sheer preference for dividends.

The cyclical variation in these results also has direct implications for corporate financing and capital formation. In general, a cyclically high value of dividends relative to capital gains will call forth not only a higher retention rate but also a shift from debt to equity finance. To the extent that the same measure also represents the value in the market of an additional dollar of corporate investment, a cyclically high relative value of dividends also indicates an incentive to increased physical investment.

Roger H. Gordon and Burton G. Malkiel, in their paper "Taxation and Corporate Finance" (forthcoming as part of a Brookings Institution book bearing the same title), addressed the distortions to U.S. corporate

financing and investment decisions introduced by taxation when the possibility of costly bankruptcy exists. Gordon and Malkiel used both time series and cross-section data on variations in U.S. corporate debt-equity ratios to examine the implications of a model of corporate financing and investment that explicitly allows for the possibility and costs of bankruptcy. Using data from actual bankruptcy experiences, they also estimated the magnitude of the efficiency costs associated with the distortions due to the existing tax structure, as well as the efficiency implications of several possible modifications of that structure.

Gordon and Malkiel's results indicated that, as long as corporations behave competitively, explicit allowance for bankruptcy costs is essential to explaining the observed corporate financial structure. Otherwise the theory leads to conclusions with clear counterfactual implications. The historical experience in the United States since World War II involved steadily increasing debt-equity ratios on balance until 1974. Their theory explains this pattern in terms of increasing inflation and interest rates together with increasing optimism about the future prospects of the corporate sector until the early 1970s. The greater instability of the economy during the mid-1970s apparently altered firms' assessments of possible bankruptcy costs, however, and debt ratios were slightly reduced after 1974.

Gordon and Malkiel's results also indicated that at least some of the distortions associated with the existing tax structure are quantitatively important. They estimated that the efficiency costs arising from tax incentives to increase debt-equity ratios are on the order of \$3 billion per year, or about ten percent of corporate tax payments. By contrast, they found that the efficiency costs of distortions in the allocation of capital between the corporate and noncorporate sectors may be less important, especially in comparison with previous estimates using earlier models. In particular, their estimate of these costs is only one-fourth to one-third as large as previous estimates. Primarily as a result of the larger efficiency costs of distortions affecting debt-equity financing decisions, any of several changes in the tax structure aimed at lessening financing distortions in favor of debt would offer significant efficiency gains.

Martin Feldstein and Stephanie Seligman, in their paper "Pension Funding, Share Price, and National Saving" (*Journal of Finance*, in press), examined the effects of unfunded pension obligations on corporate share prices and explored the implications of these effects for national saving, the decline of the equity market in recent years, and the rationality of corporate financial behavior. Their analysis was based on information about inflation-adjusted income and assets for nearly two hundred large U.S. manufacturing firms.

Feldstein and Seligman found that corporate share prices fully reflect the conventional accounting measure of unfunded pension obligations.

The most important implication of this share price response is that the existence of unfunded pension liabilities does not necessarily entail a reduction in total private saving. Because the pension liability reduces the equity value of the firm, shareholders are given notice of its existence and hence an incentive to save more themselves. Unfunded private pensions therefore differ fundamentally from unfunded government-sponsored pensions like Social Security and civil service and military pensions.

Feldstein's paper "Private Pensions as Corporate Debt," which appears as Chapter 5 of this volume, summarizes and extends this work.

Finally, in my own paper, "The Relative Stability of Money and Credit 'Velocities' in the United States: Evidence and Some Speculations" (NBER Working Paper No. 645), I documented a long-standing stability in the relationship between outstanding debt and economic activity in the United States, and explored the implications for capital formation of several hypotheses that could explain this observed phenomenon. In particular, I showed that the aggregate of outstanding credit liabilities of all nonfinancial borrowers in the United States bears as close a relationship to U.S. nonfinancial activity as do the more familiar asset aggregates like the money stock (however measured) or the monetary base. This stability in the debt-to-income relationship reflects the net outcome of pronounced but offsetting movements of the public and private components of the total debt aggregate.

I suggested three different hypotheses that provide potential explanations for this phenomenon. Two of these hypotheses, one emphasizing taxpayers' actions and one based on credit market borrowing constraints, carry the implication that increases in government debt outstanding associated with financing budget deficits crowd out private financing and hence private capital formation. The third hypothesis, which emphasizes the portfolio preferences of lenders, implies that increased government financing will not crowd out private capital formation but will cause the private sector to shift from debt to equity financing.

My paper "Debt and Economic Activity in the United States," which appears as Chapter 6 of this volume, summarizes and extends this work.

