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Are the Distinctions between Debt and Equity Disappearing?

Proceedings of a Conference Held in October 1989

Richard W. Kopcke
and
Eric S. Rosengren, Editors

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Are the Distinctions between Debt and Equity Disappearing? An Overview

*Richard W. Kopcke and Eric S. Rosengren**

During the 1980s, the proportion of business assets financed by debt exceeded that of any other period since World War II. Although much of this leverage accommodated new investment, during the last half of the decade corporations also replaced more than one-sixth of their outstanding stock with debt securities. Because of this surge in leverage, many analysts and policymakers are wary that businesses may have become too vulnerable, perhaps imperiling prospects for capital formation and employment opportunities.

As the financial structure of businesses changed during the past decade, the characteristics of financial securities also changed. Junk bonds, variants of preferred stock, yield enhancements, warrants, and other forms of mezzanine financing became more common in credit markets and in private loan contracts. Furthermore, the potential risks and returns offered by all securities have been altered as otherwise familiar financial instruments increasingly contain novel options (puts, indexed terms, resets, auctions, caps) and as derivative securities and various swap agreements are accepted as standard financial instruments.

These innovations have challenged the traditional financial and legal distinctions between debt and equity. Accordingly, public policy may need to adapt along with financial relationships, because income tax laws, regulations governing financial institutions, corporation law, and definitions of the legal rights and responsibilities of an enterprise's

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owners or creditors depend on clear boundaries to separate classes of creditors and equityholders. For example, if varieties of debt and equity instruments are more commonly regarded merely as alternative methods of financing businesses, both the bankruptcy law's distinctions among stakeholders and the income tax law's traditional distinction between interest payments (an expense) and profits (taxable income) may need to be amended. Similarly, many of the laws, regulations, and conventions that encourage financial intermediaries to hold debt rather than equity may require revision. Whether these distinctions account for the recent increase in leverage or not, if policymakers regard leverage as excessive, reforms of the appropriate laws and regulations could foster equity financing.

In the fall of 1989 the Federal Reserve Bank of Boston sponsored this conference to examine the changes in business financing, why these changes have occurred, and the implications of these changes for public policy. In general, the participants observed that no simple theory explains fully the recent trends in business finance. For example, tax laws alone do not determine a corporation's capital structure. A satisfactory explanation might also depend on agency costs, objectives of stakeholders, the importance of corporate control, financial regulations, the relative cost of funds, and the dynamic strategies of management. Consequently, an attempt to reduce leverage through a simple reform of tax law, financial regulations, or bankruptcy law may not succeed. Even if it were successful, the cost of reforming policy could exceed its benefits, especially if other objectives of these policies were compromised in order to regulate leverage. Many participants also questioned the threat posed by the recent surge in debt financing. Some thought that the trend toward greater leverage has run its course, and equity financing will become more prevalent.

The conference comprises three sections. The first section surveys the financial and legal theories concerning an enterprise's choice of capital structure. The financial survey concludes that a promising financial theory is more likely to describe the optimal form of financial contracts, rather than confining itself to determining the optimal degree of leverage. The fundamental innovation is the recent change in the characteristics of contracts, rather than a simple increase in leverage. The legal survey finds that, for solvent corporations, the distinction between the rights of creditors and those of shareholders is sharp. But for insolvent corporations the rights of various stakeholders are often negotiable, and this in time may erode the distinctions between the discrete contracts of debt instruments and the relational contracts of equity instruments.

The second section discusses the practical motives of savers and investors that might account for the recent increase in leverage. Corpo-

rations have demonstrated a preference for financing their assets with their own cash flow, and if external financing is necessary they favor debt over equity. Accordingly, a corporation has no fixed target for its leverage; when opportunities to expand assets are sufficiently inviting and when the cost of debt financing is relatively attractive, leverage will tend to increase. While the inclination to supply more debt has increased during the current economic recovery, the demand for debt instruments also may have increased as regulations and accounting conventions encouraged pension funds to match their assets to their sponsors' liabilities. Nevertheless, the substantial retirement of equity during the past five years remains a novel puzzle.

The last section examines the influence of income tax laws and financial regulations on leverage. Although the tax law encourages corporations to rely on debt financing, neither the timing nor the magnitude of recent changes in the tax law can explain the surge in debt financing. Popular proposals for reforming the tax code in order to remove this bias in favor of debt financing would either reduce revenues considerably or introduce new distortions into the income tax. Because the effects of tax laws on corporate financial decisions are poorly understood, conducting financial regulation through these laws may be costly. Instead, minimum capital requirements may be applied directly to corporations. In addition, the regulations that strongly encourage banking institutions and other financial intermediaries to hold debt rather than equity may be relaxed. Although these regulations were intended to make these intermediaries and the economy more stable, they can foster risky investments, making the economy less stable. Acordingly, the benefit from reforming financial regulations may be relatively great.

The Changing Nature of Debt and Equity

Why do businesses rely so greatly on debt financing? Why are debt instruments including more equity features? While biases in the income tax code are important determinants of capital structure, the first two sessions discuss other explanations. The participants in these sessions agree that new views of financial instruments are becoming necessary as debt and equity contracts become less distinct. The members of the finance sessions examine the economic incentives for issuing a spectrum of securities, while those of the legal session discuss the rights and responsibilities of the investors who hold these securities.

A Financial Perspective

Franklin Allen, of the University of Pennsylvania, introduces several themes discussed throughout the conference: that financial innovation has introduced hybrid securities blending the characteristics of debt and equity, that the characteristics of these securities are not determined by tax laws alone, and that the incentives of stakeholders may better explain firms' financial structures. Financial theories focusing on tax burdens, the cost of bankruptcy, or asymmetric information among stakeholders do not explain either the rapid introduction of hybrid securities or the significant changes in leverage over the past ten years.

The recent introduction of many hybrid securities suggests that financial theories defining optimal ratios of debt to equity are not as promising as those describing the optimal forms of securities. The diverse interests of heterogeneous stakeholders might be satisfied best by a variety of financial instruments. In the case of public corporations, pure debt and equity contracts are not necessarily best suited to the interests of management and the various providers of external financing. The optimal payments to "creditors" might depend on the performance of the corporation, and the optimal division of voting rights need not allow one vote per share and majority rule. Furthermore, the spectrum of securities that might best meet the needs of corporate stakeholders might not ensure efficient capital markets and, therefore, might not be optimal from a social point of view.

Oliver D. Hart, from the Massachusetts Institute of Technology, contends that the theory regarding the control of assets is more robust than Allen suggests. The major attribute of equity, according to Hart, is ownership. Owners of an asset not only hold a residual claim on its returns but also choose how to employ that asset. Even without differences in the tastes of stakeholders or difficulties in verifying a firm's performance, for example, equityholders differ from creditors because of their ability to control the enterprise.

Robert C. Merton, from the Harvard Business School, suggests that promising theories regarding the choice of capital structure appear not to depend on the demands of investors. Because investors are concerned with the risk of their portfolios rather than the risk of particular securities, firms need not issue a variety of securities, since intermediaries could repackage the financial claims issued by firms to create portfolios that are most appealing to investors. For example, if firms issued equity only, financial intermediaries could acquire these equities and issue the appropriate spectrum of securities backed by the firms' assets. In this case, the operation of the firms would be insulated from any defaults that might occur on "their" financial liabilities.

A Legal Perspective

Charles P. Normandin, from the Boston law firm of Ropes & Gray, observes that the traditional legal distinctions between the rights and responsibilities of shareholders and those of creditors have been strained. Management possesses broad fiduciary responsibilities that provide it with substantial discretion to operate the business in the best interest of shareholders. For solvent firms, the relationship of management to creditors is contractual, providing specific responsibilities defined by loan agreements. Despite challenges claiming that management's fiduciary responsibility should be extended to creditors, recent judgments have found that creditors cannot expect the courts to intervene in their contracts. Considerable problems may arise as firms seek financing from different sources at different times, but creditors must either protect themselves through appropriate contractual commitments or refuse to supply funding.

The insolvent corporation and its management owe fiduciary duties to the various classes of creditors as well as to stockholders, but the law gives only vague guidance for balancing these often incompatible responsibilities. In such cases, the classification of claimants will become more difficult, and the legal rules governing the concessions among claimants may become too restrictive to achieve an acceptable reorganization. Consequently, the traditional distinctions among stakeholders may blur, as the courts try to cope with financial innovations.

Robert E. Scott, from the University of Virginia School of Law, disagrees with Normandin's view that firms have a voluntary contractual agreement with creditors and a fiduciary responsibility to shareholders. Instead, the firm's relation with both creditors and shareholders is contractual. Two different contracts can apply to the firm. Discrete contracts provide detailed specifications that standardize the contract and simplify the monitoring of the contractual relation. Relational contracts are used when the uncertainty and complexity of the relationship prevent all contingencies from being specified, requiring a more general contractual commitment. While debt has been considered a discrete contract and equity a relational contract, these designations are being eroded by financial innovations. As debt instruments include characteristics of equity, they too must be considered relational contracts. When courts interpret these contracts they should promote value-maximizing transactions.

Richard T. Peters, a partner in the Los Angeles law firm of Sidley & Austin, discusses the legal uncertainty surrounding the distinctions between debt and equity. Future litigation will focus on the standing of debt and hybrid securities used in highly leveraged transactions when a firm declares bankruptcy. Since many of these securities could be

considered substitutes for existing capital, they may not be treated as traditional debt instruments in corporate reorganizations. Until the courts decide more cases involving leveraged buyouts, particularly how the instruments issued in leveraged buyouts are classified in a reorganization and how voting power and responsibilities of management should be allocated among the different classes of creditors, negotiating reorganizations will remain difficult.

Why Debt and Equity Have Changed

Why are businesses now relying on debt financing more than in the past? The next two sessions discuss the motives of businesses and institutional investors that may account for this surge in leverage. The first session examines the firm's motivations for issuing debt, discussing the influence of external financing and conflicts among stakeholders on a firm's choice of capital structure. The second session discusses how the goals, traditions, and regulations governing pension funds may have increased the demand for debt relative to that for equity.

The Firm's View of Debt and Equity

Stewart C. Myers, from the Sloan School of Management at the Massachusetts Institute of Technology, surveys the evidence for three theories of capital structure: the trade-off theory, the pecking order theory, and the organizational theory, and concludes that some combination of the pecking order theory and the organizational theory best fits recent trends in capital structure.

The trade-off theory contends that firms issue debt until the value of the tax shield on debt equals the expected costs of bankruptcy. Myers observes that this simple model cannot explain two empirical regularities. First, stock prices rise for firms announcing actions that will increase their leverage, while stock prices fall for firms announcing actions that will reduce their leverage. The trade-off theory predicts that stock prices should increase with any change in leverage, because managers should always be approaching, rather than retreating from, the optimal capital structure. Second, the most profitable firms in an industry borrow less. The trade-off theory predicts that they should borrow more, because firms with higher profits have more taxable income to shield by issuing debt.

The pecking order theory is not consistent with a static optimal capital structure. Firms prefer internal to external financing, and if external financing is necessary they prefer debt to equity. Managers will never issue shares when the firm is undervalued; knowing this, inves-

tors will always view a new equity issue as bad news. The pecking order theory predicts that the issuing of new equity is bad news, while the retirement of equity is good news. It also predicts that profitable firms will tend to have low leverage.

The organizational theory assumes that management maximizes assets under its control rather than shareholders' wealth. Accordingly, management maximizes the value of equity and employee surplus, which includes perks, overstaffing, and above-market wages. Issuing new debt is good news, because it increases the value of the tax shield while diminishing employee surplus by increasing the burden of interest payments. Management prefers to rely on internal financing, so more profitable firms will have lower leverage. Myers believes that the pecking order theory and the organizational theory explain patterns of corporate finance better than the trade-off theory, and that a promising theory of corporate finance would appear to require more study of the conflicts between management and investors.

O. Leonard Darling, of Baring America, predicts that most companies will be reducing their debt. Lower leverage is necessary because the costs of financial distress now exceed the benefit of debt's tax shield for many firms. Reducing leverage will tend to create conflicts among management, shareholders, and creditors, and each firm's strategy for reducing leverage will depend on whether the firm is privately or publicly held. Publicly held companies will adopt strategies that maintain the value of equity in order to deter hostile takeovers. Privately held companies may be more willing to force transfers from creditors to equityholders by threatening creditors with bankruptcy.

Robert A. Taggart, Jr., from Boston College, contends that the recent increase in corporations' leverage at a time when internal funds were plentiful poses a problem for most traditional theories of finance. The surge in debt financing was used to retire outstanding equity, a fact that neither the trade-off theory nor the pecking order theory can explain adequately. Although the organizational theory might complement the pecking order theory to explain this change in capital structure, the organizational theory needs further development in order that we may understand better how shareholders' valuations can influence managers' behavior.

The Lender's View of Debt and Equity

Zvi Bodie, from the Boston University School of Management, contends that recent financial innovation can be attributed partly to changes in the demand for securities by lenders. He illustrates this argument by discussing how regulations and accounting requirements have influenced the recent behavior of the pension fund industry.

The investment policies of pension funds, which hold 25 percent of outstanding common stock and 39 percent of outstanding corporate bonds, are guided by government regulations and sponsors' needs to meet their obligations to their plans' beneficiaries. Regulations and accounting conventions increasingly have encouraged pension funds to "immunize" their portfolios by matching their assets to their sponsors' liabilities. This demand has fostered the development of derivative securities such as index options and futures contracts. It has also encouraged pension funds to hold fixed-income securities whose duration matches that of their liabilities more closely than do the durations of stock or floating-rate bonds. Thus, both the increase in leverage and the introduction of new securities can be attributed partly to the demands of investors such as pension funds.

Peter L. Bernstein, from Peter L. Bernstein, Inc., is skeptical that the recent increase in corporate leverage might be explained by pension funds' needs to run a matched book. Pension funds, like the many other investors who purchased debt, were attracted by the high real returns on debt available in the early 1980s. Pension funds purchased much of the corporate debt even though these securities were not as appropriate as government debt for immunization strategies because government debt, unlike corporate debt, cannot be called when interest rates fall. To a degree, the pension funds' demand for corporate debt was fostered by the equity features of these securities.

Benjamin M. Friedman, from Harvard University, also is not convinced that hedging by investors such as pension funds could explain the increase in corporate leverage. While pensions may wish to hedge their liabilities, derivatives of government securities would be more suitable than corporate debt. Junk bonds, the fastest growing component of corporate debt, are not appropriate for hedging because of their relatively short durations and because of their substantial risk of deferred repayments, diminished repayments, conversion to equity, or outright default.

Implications for Public Policy

The final two sessions examine the effects of public policies on the capital structure of businesses. The first session considers whether the recent reforms of the income tax code encouraged businesses to rely on debt financing more than they had in the past. This session also discusses the potential problems of using the tax codes to regulate the capital structures of businesses. The second session considers how the regulation of financial intermediaries, such as banks, fosters debt financing. This session also discusses whether new banking regulations might promote more equity financing without necessarily making financial intermediaries less secure.

Taxation of Debt and Equity

Alan J. Auerbach, from the University of Pennsylvania, questions the importance of taxation in explaining the recent increase in leverage. Neither the timing nor the magnitude of tax changes can account for nonfinancial corporations' recent reliance on debt. The recent revisions of the tax law have had mixed effects; for some investors the relative advantage of holding debt has increased, for others equity has become more attractive.

Although changes in the tax law are not clearly responsible for the recent increase in leverage, for decades the tax law has encouraged firms to rely on debt financing, by imposing a lower tax burden on corporate assets financed by debt than that imposed on assets financed by equity. Auerbach considers several proposals that either would integrate corporate and personal taxes or would tax corporations on their cash flow. These proposals entail a large loss of tax revenues or introduce new complications and distortions into the tax code. Given the uncertainty about the causes and costs of increased leverage, it is not clear that the benefits of these tax changes would exceed their costs.

David F. Bradford, from Princeton University, reemphasizes that the effects of tax laws on corporate financial decisions are still poorly understood. For example, why do corporations pay dividends rather than repurchase their stock given that stock repurchases would increase most shareholders' net returns? Until we better understand the effects of taxation, we should be very cautious about using the tax code to regulate business capital structures.

Emil M. Sunley, from Deloitte Haskins & Sells, agrees that changes in tax laws do not explain the increase in corporate borrowing and that the social costs of increased leverage may have been overstated. He also is skeptical of proposals to eliminate the tax bias favoring income accruing to corporate assets financed by debt. Integration of corporate and individual taxes would redistribute tax burdens unevenly across industries and across firms within industries. Furthermore, some technical problems with integration remain unresolved, such as the proper treatment of holding companies or multiple classes of stock. Cash flow taxes also have problems concerning the proper treatment of investments and debt undertaken before the tax reform and the proper division of tax revenues between the United States and countries that tax corporate income.

Regulation of Debt and Equity

Richard W. Kopcke and Eric S. Rosengren, from the Federal Reserve Bank of Boston, contend that the regulation of financial inter-

mediaries can affect corporate capital structure. Household portfolios have been shifting from equity toward the liabilities of financial intermediaries. In turn, the assets of these intermediaries are invested mostly in debt instruments. Consequently, this shift in household portfolios has tended to increase the supply price of equity financing relative to that of debt.

This bias in favor of debt financing may be attributed partly to the regulations that govern financial intermediaries. While "deposit insurance," explicit or implied, attracted households' funds, government regulations had not allowed intermediaries such as banks and insurance companies to purchase equities. Contracts governing pension funds' investments also constrained their holding equities, to a degree. Although these regulations were intended to make intermediaries, financial markets, and the economy more stable and secure, they might foster relatively risky investments. Instead of restricting the assets that intermediaries may purchase, often favoring debt over equity, regulations should control risk by enforcing substantial minimum capital requirements, to be funded by common stock.

Ben S. Bernanke, from Princeton University, is skeptical that savers' preferences could explain the increase in leverage over the past twenty years. He notes that pension funds, the fastest growing intermediary, hold a larger share of their assets in equity than do households. The decisions of firms, rather than those of investors, would appear to be responsible for the recent increase in leverage. Although the motivation for financial regulation is weak, he agrees that such regulation should emphasize capital requirements rather than asset restrictions.

Albert M. Wojnilower, from The First Boston Corporation, criticizes the recommendation that asset restrictions be reduced. Allowing depository institutions to hold equity and requiring them to value their assets using current market prices would destabilize the financial system. He agrees that binding capital requirements would make the economy more stable. Moreover, extending capital requirements to large nonfinancial corporations would reduce the systemic risk stemming from the failure of highly leveraged businesses. Violation of these requirements could entail a loss of tax benefits on excessive debt and, potentially, the dismissal of senior management.

Conclusion

During the past decade firms have significantly increased their reliance on debt that frequently possesses some of the features of equity. Although the prevailing income tax laws have encouraged firms to issue

debt, the timing and magnitude of the changes in leverage do not coincide with changes in the tax code.

Many of the conference participants discussed how the conflicting interests of diverse stakeholders may have encouraged the recent increase in corporate leverage. For example, disagreements among investors, management, and employees regarding the control and use of assets increasingly result in takeovers financed substantially with debt.

Several participants emphasized the importance of financial intermediaries for financing business investments. Intermediaries issue liabilities that are most appealing to savers, using the proceeds to purchase the securities issued by businesses. As intermediaries have become more important, binding financial regulations, which generally restricted their ability to purchase equity, may have fostered greater leverage by increasing the relative supply price of equity.

Participants agreed that traditional distinctions between debt and equity will be challenged by the introduction of new hybrid securities. Legal, tax, and regulatory policies, which may have fostered these financial innovations, must themselves change in order to cope with emerging patterns of business financing. Promising revisions of public policy would foster financial contracts that minimize the social costs of resolving conflicts among a business's stakeholders, while promoting a relatively efficient and stable flow of resources from savers to investors.

The Changing Nature of Debt and Equity: A Financial Perspective

*Franklin Allen**

Historically, corporations have mainly financed their activities with two securities, debt and equity. The stockholders have responsibility for the operation of the firm through the election of the board of directors; the dividends they receive in return for their subscription of capital are not guaranteed and are paid at the discretion of the board of directors. In contrast, debtholders are promised a particular rate of return; they have no rights of control unless payments by the firm are omitted, in which case they have the right to foreclose on assets or, in some cases, force bankruptcy. Dewing (1934, pp. 236-37) ascribes these differences in rights between debtholders and equityholders to the historical distinction in Anglo-Saxon law between debtors and creditors.

As a result of the importance of debt and equity, the focus of inquiry into firms' choice of capital structure has traditionally been "What is the optimal debt-equity ratio?" Modigliani and Miller (1958) and subsequent authors[1] showed that if capital markets are perfect and complete and no taxes are in effect, a firm's debt-equity ratio has no effect on its value because investors' opportunity sets are not affected by its capital structure. If a corporate income tax is in effect, with interest deductibility, Modigliani and Miller (1963) used the same logic to show firms should use entirely debt finance since this allows corporate taxes to be avoided.

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[1] See, for example, Hellwig (1981) and the references therein.

This prediction of the theory did not square well with empirical evidence; despite interest deductibility and a corporate tax rate of almost 50 percent at that time, firms typically used only moderate amounts of debt. This led a number of authors[2] to point to the capital market imperfection of bankruptcy and liquidation costs. They suggested that a firm balances these costs against the tax advantage of debt and it is this trade-off that determines the optimal debt-equity ratio.

The trade-off theory has been criticized on a number of grounds. Evidence on the direct costs of bankruptcy, such as lawyers' fees, suggested they were small (Warner 1977). Direct measurement of the indirect costs of bankruptcy, such as the difficulties of running a firm while it is in bankruptcy court, are difficult to obtain; proponents of the trade-off theory suggest they are significant while detractors suggest they are small relative to the tax advantage of debt. It is widely agreed that liquidation costs, which are the costs of breaking up a firm and selling it off piecemeal, are sufficiently large to explain firms' observed debt ratios if included with bankruptcy costs. However, Haugen and Senbet (1978) argued that liquidation costs should not be included with bankruptcy costs since liquidation was not implied by bankruptcy; if the firm was worth more as a going concern it would not be liquidated. In addition, they argued that if bankruptcy was costly it could be avoided by firms' buying back their debt just before it became due. These arguments depend on perfect markets; a number of recent papers have investigated why bankruptcy and liquidation may be linked and why bankruptcy may be difficult to avoid by repurchasing securities when markets are imperfect.[3]

The deficiencies of the trade-off theory resulted in the development of a number of alternative theories. Miller (1977) pointed to the importance of personal taxes. He argued that personal taxes on equity were lower than on debt and presented a model where this personal tax disadvantage of debt entirely offset its corporate tax advantage so that in equilibrium each firm was indifferent between the use of equity and debt. De Angelo and Masulis (1980) and subsequent authors[4] developed this model to allow for bankruptcy costs and other factors; in this case again a trade-off exists between the use of debt and equity and firms have an interior optimal capital structure.

Some of the alternative theories that did not rely on the inclusion of personal taxes were based on asymmetric information. Agency theories

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[2] See, for example, Kim (1978) and the references therein.

[3] See, for example, Titman (1984); Allen (1987); Webb (1987); Giammarino (1989); and Mooradian (1989).

[4] See Kim (1989) for a survey of this literature.

started from the premise that managers' actions could not be fully contractually specified because they were unobservable and would be influenced by capital structure choices (Jensen and Meckling 1976; Myers 1977; and Green 1984). Signaling theories were based on the idea that firms' capital structure choices could convey information about their prospects to investors (Ross 1977; Myers and Majluf 1984; and Brennan and Kraus 1987). More recently, it has been suggested that imperfectly competitive markets for outputs and inputs and opportunities for product innovation may influence firms' choice of capital structure.[5]

The deficiencies of these theories in explaining the use of debt and equity by firms are well documented by Myers (1984). He gives the following succinct summary of the literature (p. 575): " 'How do firms choose their capital structures?' . . . the answer is 'We don't know.' "

Financial Innovation

The notion that firms finance their activities with debt and equity is a simplification; corporations have issued securities other than standard debt and equity for many centuries. Dewing (1934, p. 135) recounts that multiple classes of stock with certain preferences or disabilities were issued by some of the first English companies in the middle of the sixteenth century. He also gives examples (pp. 377-78) of a number of English firms that issued convertible securities in the seventeenth and eighteenth centuries.

In the United States, corporations also have a long history of use of securities other than debt and equity. Since the late 1880s, firms have issued significant amounts of preferred stock. This form of stock combines many of the features of equity with those of debt; in particular, a level of payments is specified, as with debt, but unlike debtholders, investors in preferred stock cannot force bankruptcy if the firm omits these payments. Firms have also issued income bonds at various times since 1848. Like preferred stock, income bonds have a number of features of debt and equity. Unlike preferred stock, the specified payments are not at the discretion of the board of directors but depend on the level of accounting earnings. If they are omitted, however, the securityholders cannot force bankruptcy. Still other types of securities such as convertible bonds and warrants have also been issued by corporations for many decades. Dewing (1934) gives a full account of the early history of these securities.

Financial innovation is, therefore, not a recent phenomenon. How-

[5] See Ravid (1988) for a survey and also Baldwin (1983a, 1983b, and 1988).

ever, Miller (1986) suggests that financial innovation has proceeded at a particularly fast pace during the last twenty years. Not only have corporations started to issue new securities such as zero coupon bonds and adjustable rate bonds, but also entirely new markets such as the Chicago Board Options Exchange have been established.[6]

Miller argues that much of this recent innovation is in response to features of the tax code and to regulation. A classic example of innovation in response to the tax code is zero coupon bonds. Before the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), the tax liability on zero coupon bonds was allocated on a straight line basis; that is, the annual interest deduction was the amount to be repaid at the due date less the issue price, divided by the number of years until repayment. This rule ignored the effect of compounding of interest and created an opportunity for corporations to avoid taxes by issuing long-term zero coupon bonds to tax-exempt investors. When interest rates were high in the early 1980s, the potential tax benefits from this type of security became large and corporations issued a large amount of these bonds. Although TEFRA closed this loophole, the market for zero coupon bonds continued but now was mainly supplied by investment banks "stripping" government securities into principal and interest (Kanemasu, Litzenberger, and Rolfo 1986).

An alternative rationale for financial innovation, stressed by Van Horne (1985), is that new securities may make markets more complete in the sense that they increase opportunities for risk sharing between investors. In a categorization of the primary factors responsible for the introduction of sixty-eight new types of security, Finnerty (1988) lists tax and regulatory advantages in twenty-seven cases and risk reallocation in fifty-three cases. (More than one factor is possible for each type of security.)

In addition to taxes and regulation and risk reallocation, another important class of security innovation has resulted from attempts by incumbent managements to discourage takeovers. Examples of these "poison pill" defenses are preferred stock plans, flip-over plans, back-end plans and voting plans. The securities associated with these plans all have the common feature that on the occurrence of a takeover attempt not approved by the board of directors, certain rights accrue to the securityholders. For example, target shareholders may be given the right to buy the stock of the bidder at a substantial discount on completion of the takeover.[7]

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[6] For a full account of recent innovation see Finnerty (1988).

[7] See Malatesta and Walkling (1988) for a more complete description of actual poison pills.

Tufano (1988) has constructed a data base of fifty-eight financial innovations introduced by investment banks between 1974 and 1987. These innovations, often bonds, equities or preferred stocks with novel features, can cost substantial amounts to develop. Tufano finds that the banks that create these products almost immediately face competition from rivals offering imitative products. During the brief period of monopoly before imitation, originators do not charge high prices to recoup their development costs. Moreover, once the imitative products appear, they charge a lower rather than a higher price than the imitators. The main difference between the originating bank and imitators is that the originating bank obtains a larger share of the market. Tufano gives a number of reasons why market share may allow originators to recoup the costs of developing the products. Sunk costs may be involved in entering the underwriting business. These may deter entry and allow positive profits; price competition may be limited by the type of noncooperative collusion considered by the threat of reverting to the single-period equilibrium. Another possibility is that the bank may make profits on related business so that it can recapture the costs in this way.

The fact that debt and equity are not the only securities that firms use to finance their activities, and the constant introduction of new forms of securities, suggest that a more fundamental issue than "What is the optimal debt-equity ratio?" is "What are the optimal securities that should be issued?" Many recent studies of capital structure have taken this perspective. These studies provide some insight into the changing nature of debt and equity.

This literature has two branches. The first has been concerned with trying to identify the circumstances in which debt and equity are optimal. This will be considered in the next section of this paper. The second branch has been concerned with the optimal securities that a firm should issue. The succeeding section considers this, followed by a summary and conclusions.

When Are Debt and Equity Optimal?

A number of papers have identified situations where debt contracts are optimal. Townsend (1979) considers the optimal contract between a risk-averse agent and a risk-neutral principal. In one version of the model, the agent requires funds at the beginning of the period to produce a random income at the end. The principal can observe the realization of the agent's income only if bankruptcy is declared and the agent's income is transferred to the principal. This bankruptcy process is costly. Among the class of deterministic strategies, where the principal

observes the agent's income with probability either one or zero, Townsend shows that debt is an optimal contract. This requires the agent to pay a constant amount to the principal; if the agent's income is insufficient to pay this amount, then bankruptcy is declared and the agent's income is transferred to the principal.

This basic idea has been used by a number of authors to consider the role of debt contracts in various contexts. For example, Diamond (1984) used a similar framework to explain the use of debt contracts by financial intermediaries such as banks. Gale and Hellwig (1985) consider the case where the agent's investment is mutually observable in order to show that underinvestment can occur.

Allocation of Cash Flows

An important issue is whether this type of analysis can be applied to corporate securities. If the agent is interpreted to be the insiders that operate the firm, and the principal the outside investors that supply capital, then the optimal security for the firm to issue is debt. The question is whether equityholders correspond to the insiders that run the firm or the outside investors. For privately held firms, the equityholders correspond to the insiders that run the firm. For publicly traded corporations, however, most equityholders are outside investors with access to the same information as bondholders; in this case it is not immediately evident that Townsend's type of analysis can be used to justify the existence of debt and equity.

Williams (1989) develops a model to consider this issue. He assumes markets are complete in the sense that everybody is effectively risk neutral with respect to aggregate-state prices. However, asymmetric information about the earnings of individual firms in any particular period can only be observed by the managers or insiders that run the firms; as a result securities cannot be made contingent on earnings in a manner similar to Townsend's type of analysis. In addition, Williams introduces "ex ante monitoring," such as accounting controls, which prevents the managers from simply expropriating a firm's assets. It is also assumed that an agency problem exists between managers and outside investors. It is shown that it is optimal for the firm to issue debt or stock or both to outside investors, with the precise mix of securities depending on the nature of the agency problem.

An important issue is how general the assumptions of the model are and, in particular, the circumstances in which markets are complete in the sense that managers are effectively risk neutral with respect to aggregate-state prices. One possibility is that the managers are risk neutral; if they are risk averse, the fact that they cannot trade securities

state by state that are contingent on the firm's earnings will presumably prevent markets from being effectively complete.

In addition to the applicability of this type of analysis to corporations, another issue to be considered is the assumption by Townsend that strategies are deterministic, so that income is observed by declaring bankruptcy with probability one or zero. Mookherjee and Png (1989) show that if random strategies are possible, then the optimal contract involves randomization. To see why it is possible to do better with random strategies, consider the optimal deterministic contract, which is a debt contract. Suppose that the agent is now made to announce his income, and bankruptcy occurs with probability one whenever the announced income is less than the required payment. During bankruptcy, the true value of the agent's income is revealed. By rewarding the agent when he has correctly announced his income level, it is possible to provide a strict incentive to tell the truth. This means it is no longer necessary to force bankruptcy all the time. Since the agent is risk averse and the principal is risk neutral, this change allows a Pareto improvement. The important issue here is whether randomization is possible. If a device exists that both parties know is truly random, then Townsend's type of analysis is unable to provide a rationale for debt contracts, but if such randomization devices do not exist, it can.

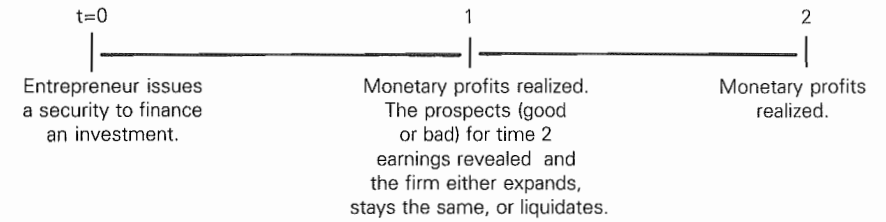
Allocation of Control Rights

The papers considered above are primarily concerned with the allocation of cash flows. In a recent paper, Aghion and Bolton (1988) take a different approach by looking at the allocation of control rights among different securityholders in closely held firms. They consider a model with the sequence of events shown in Figure 1. An entrepreneur has insufficient resources of his own to finance a project he wishes to undertake. The project involves an outlay at time 0 and yields revenues at time 1 and time 2. The entrepreneur can finance the investment by issuing securities at time 0 to an outside investor who receives a portion of the firm's profits at time 1 and time 2. Both the entrepreneur and the investor are assumed to be risk neutral, so that risk-sharing issues are not considered in the model.

At time 1, the firm's monetary profits and its prospects for future earnings, which can be either good or bad, are determined. After receiving this information, the party in control of the firm decides on which of three possible courses of action to undertake: expand the firm, continue as before, or liquidate. If the time 1 prospects for future earnings are good, expansion leads to the highest expected profits, continuing as before the next highest, and liquidating the least. If the

Figure 1

The Sequence of Events in the Aghion and Bolton (1988) Model



prospects are bad, the reverse is true. The private costs to the entrepreneur of the three courses are different, with liquidation being the most costly, expansion the next most costly, and keeping operations the same the least costly. The magnitudes of the expected monetary profits and private costs to the entrepreneur are such that in the first-best world where all states can be contracted on, it is optimal for the firm to continue operations as before in the state where prospects are good, and liquidate in the state where prospects are bad.

The critical assumption that Aghion and Bolton make is that contracting possibilities are incomplete. In particular, the earnings prospects cannot be contracted upon; the only variable that can be contracted on is monetary profits. This creates two problems. The first occurs if the entrepreneur uses securities that cede control of the firm to the investor and the good state is realized. In this case, the investor would like the firm to expand since this maximizes expected monetary profits. However, this is not optimal since it imposes large costs on the entrepreneur; when these costs are taken into account, continuing the current level of operations is optimal.

The second problem occurs if the entrepreneur retains control. Now if prospects are good the efficient action of continuing operations will be chosen; however, if prospects are bad the entrepreneur may not have the correct incentives to liquidate. The entrepreneur bears high private

costs with liquidation; unless he also receives a high proportion of the monetary profits so that most of the marginal benefits of liquidation are obtained, it will be not be worth doing. The problem is that since it is not possible to distinguish between states where earnings prospects are good and states where they are bad, it is also necessary to give the entrepreneur most of the monetary profits in the good state. The overall payoff to the investor is then insufficient to make financing the project worthwhile. Hence, a drawback also exists if the entrepreneur retains control.

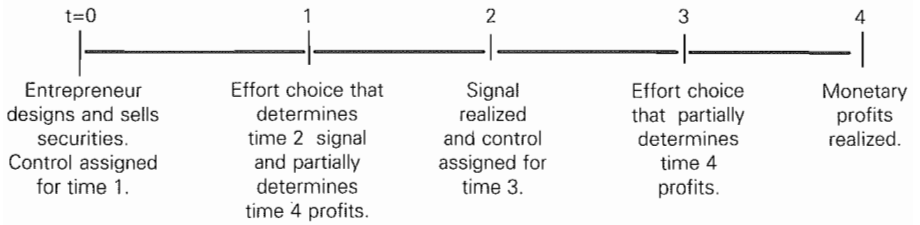
These arguments imply that giving the control entirely to either the investor or the entrepreneur may mean the first-best contract cannot be implemented: if the investor has control, the entrepreneur may be forced to expand, which has high private costs; but if the entrepreneur has control, he may be unwilling to liquidate because of the high private costs associated with that. Ideally, what is required is a mechanism that grants control to the entrepreneur when earnings prospects are good and to the investor when they are bad. Aghion and Bolton argue that the use of debt by the entrepreneur and the institution of bankruptcy can achieve this outcome, if monetary profits and the prospects for future earnings are positively correlated at time 1: for example, in the case where they are perfectly correlated, when earnings prospects are good, monetary profits are high and the entrepreneur retains control. When earnings prospects are bad, monetary profits are low, and if the level of debt issued initially has been correctly chosen, the firm will go bankrupt and control will be transferred to the outside investor.

Zender (1989) also develops a model based on the allocation of control rights where the use of debt and equity is optimal for closely held firms. Once again, all agents are risk neutral so that risk-sharing considerations are not considered in the model. The sequence of events is illustrated in Figure 2. At time 0, an entrepreneur designs and sells securities to two identical investors to finance a project. Individually, neither investor has the funds to finance the project so both must contribute money if the project is to be undertaken. The investor who is assigned control then hires a manager who undertakes an effort choice at time 1. No agency problem exists between the manager and the investor, so the manager acts as the investor specifies. The time 1 effort choice determines the level of a signal at time 2 and partially determines the level of profits at time 4. In addition to the signal that is observed at time 2, control is allocated for time 3. At time 3, the party in control again specifies an effort choice for the manager. This, together with the effort choice at time 1, determines the expected monetary profits realized at time 4.

The problem in the model is to provide the correct incentives for the effort choices at times 1 and 3. A single investor with sufficient funds to

Figure 2

The Sequence of Events in the Zender (1989) Model



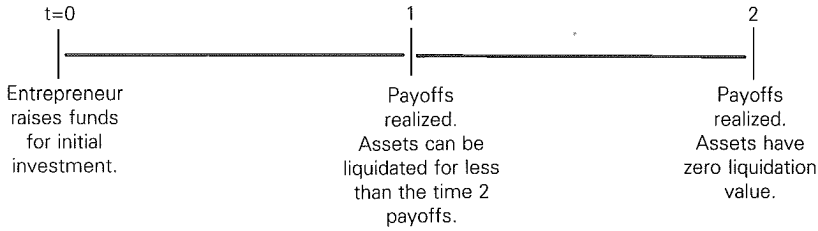
finance the entire project would obtain the full marginal benefits of the effort choices and so would be prepared to undertake the efficient level. However, because neither investor has sufficient funds to finance the entire project, the securities must be such that both have a chance of obtaining part of the time 4 payoffs. This means that the investor in control does not get the full marginal benefit of the effort choice at times 1 and 3.

Zender shows that the optimal contract involves making control at time 3 and the allocation of payoffs at time 4 contingent on the time 2 signal. If a good signal is observed at time 2, the investor in control at time 1 remains in control and retains the residual of the payoffs less a constant amount at time 4. If a bad signal is observed, then control is switched to the second investor who obtains the payoffs at time 4. This optimal contract is interpreted as the investor in control initially having equity and the other investor having debt; it ensures that the investor who is delegated control is made the residual claimant and so has incentives to make the proper decisions.

Another paper that is related to Aghion and Bolton (1988) is Hart and Moore (1989). They also consider a model of an entrepreneur who wishes to raise funds to undertake a project when contracting possibilities are incomplete. The focus of their analysis, however, is the problem of providing an incentive for the entrepreneur to repay the borrowed funds. It is the ability of the creditor to seize the entrepreneur's assets that provides this incentive.

Figure 3

The Sequence of Events in the Hart and Moore (1989) Model



The sequence of events in the simplest version of their model is shown in Figure 3. A risk-neutral entrepreneur raises funds from a risk-neutral outside investor to purchase assets that can realize payoffs at times 1 and 2. If the entrepreneur does not fulfill the contract at time 1, the outside investor can renegotiate or can seize some proportion of the assets and liquidate them. Liquidation is socially inefficient, however, because the liquidation value of the assets at time 1 is less than the present value of the time 2 payoffs. Although both the entrepreneur and the outside investor have symmetric information, third parties such as the courts cannot observe the asset payoffs so these cannot be contracted upon. The entrepreneur can appropriate the cash flows from the assets for his own use, so the problem is to design a contract that provides incentives for the entrepreneur to repay the loan.

It is shown that the optimal contract is a debt contract and the incentives to repay are provided by the threat of liquidation. Since the present value of the time 2 payoffs of the assets is above their liquidation value, the entrepreneur will always want to hold on to as high a proportion of the assets as possible and will be prepared to pay up to the assets' present value. In low payoff states, the entrepreneur will have insufficient cash to make the required payment; the outside investor therefore renegotiates the loan and liquidates a certain proportion of the assets to make the payment up to the required amount. Although this liquidation is inefficient relative to an ideal world, it is necessary because the entrepreneur cannot commit to pay any of the time 2 payoffs to the

investor. The threat of liquidation also ensures that the entrepreneur pays the required amount in high output states.

One interesting implication of the analysis is that reducing the amount borrowed is not always desirable. If the time 1 payoffs or time 2 liquidation values are uncertain, it may be better for the entrepreneur to borrow more than strictly the initial cost of the assets. This allows him to make a higher payment in low output states at time 1, so that a smaller proportion of the assets is liquidated.

A version of the model where the assets pay off at time 3 is also considered. It is shown that the use of short-term or long-term debt depends on when information arrives and the pattern of payoffs. Short-term debt gives the outside investor a high degree of control early on since the entrepreneur has to renew the loan. This has the advantage that the size of the debt can be kept low, which avoids the inefficiencies associated with liquidation. However, it has the disadvantage that the outside investor may liquidate projects early on even though this is inefficient from a social point of view. For example, if information arrives at time 1 that a project will have high time 2 payoffs and low time 3 payoffs, the outside investor may force liquidation at time 1, anticipating that it will not be possible to extract any payment at time 2. This type of inefficiency can be avoided with long-term debt.

The papers by Aghion and Bolton (1988), Zender (1989), and Hart and Moore (1989) provide rationales for the use of debt and equity by closely held firms. Their analyses raise at least two issues that remain to be fully resolved. The first is which results depend on risk neutrality and which are robust to the introduction of risk aversion. The second is that it is not immediately evident how this type of theory can be applied to justify the use of debt and equity by large corporations. The problem is how to identify the interests of managers with those of outside equity-holders, given the latter are in a similar position to outside bondholders. These are important topics for future research.

Allocation of Voting Rights

Another strand of the literature has considered the question of control in terms of the way in which voting rights should be assigned to securities. The aspect of equity that has been of particular concern is the use of one vote per share and majority voting as the decision rule. A number of papers have identified the circumstances where these provisions are optimal.

Grossman and Hart (1988) argue that the voting structure of securities is important primarily because of its impact on the market for corporate control. When securities are widely held, a free-rider problem

exists: individual shareholders do not have an incentive to carefully monitor management and vote them out when they perform badly. Monitoring of management is likely to be important when a single individual or group has a large enough ownership share to make the free-rider problem insignificant. A prime example of the type of situation where this occurs is the case of a takeover bid. Grossman and Hart therefore consider a model where the allocation of voting rights and dividends to securities is determined by its effect on allowing rivals to obtain control from an incumbent management.

Initially, the firm is owned by an entrepreneur who wishes to draw up a corporate charter that maximizes the value of the firm. Grossman and Hart are interested in schemes that are privately optimal for the entrepreneur. A number of different classes of shares can be created and the share of votes and the share of dividends accruing to each can be varied. The entrepreneur anticipates that these securities will be widely held and that the firm will be run by an incumbent management. At some date in the future, a rival team, which may or may not be able to manage the firm better than the incumbent team, may attempt to acquire control by bidding for the securities to which control rights are attached. The incumbent team makes a counteroffer and holders of the securities decide which offer to accept.

The critical assumption of the model is that management teams can obtain private benefits from controlling the firm; the optimal allocation of voting rights and dividends depends on the absolute and relative sizes of the private benefits accruing to the incumbent management team and the rival team. If private benefits are negligible, then the allocation of control is unimportant and one share, one vote is as good as any other allocation.

Grossman and Hart first consider the case where all securities of a particular class must be treated equally, so that the whole class must be purchased if the votes of that class are necessary for control. Suppose that the private benefits of control are one-sided; for example, suppose the incumbent team has no private benefits of control but the rival team does. In this case one share, one vote is optimal because it maximizes the amount the rival must pay to obtain control. If a firm has a voting structure that allows the rival to obtain control by buying securities with only a small proportion of dividends attached, then he can obtain control and the associated benefits it provides to him at a small price. This may even be worth doing when the rival cannot generate as high a dividend stream as the incumbent. In order to make sure the rival pays as much as possible for control and its associated private benefits, and in particular at least as much as the value of the dividend stream provided by the incumbent, votes must be spread as widely as possible. This

implies one share, one vote. A similar argument holds if the incumbent team has one-sided private benefits of control.

If private benefits are two-sided so that both teams value control, one share, one vote is no longer optimal. The reason is that by separating votes from dividends it is possible to get the incumbent and rival to compete for control and pay for the associated private benefits they obtain. Grossman and Hart argue that this case is of little interest empirically for large publicly owned corporations, since the extent to which management can extract benefits is limited by corporate law, which gives a corporation's directors a fiduciary duty to all shareholders. It then follows that their theory is consistent with the widespread use of one share, one vote among publicly owned corporations.

Finally, Grossman and Hart consider the case where it is not necessary to treat all holders of a particular class of securities equally; it is only necessary for the rival to obtain the proportion of votes specified in the charter to obtain control. This prespecified proportion is assumed to be between 50 and 100 percent. Ignoring the case where both incumbent and rival have private benefits of control for the reasons mentioned above, the analysis of the optimal proportion is similar to before. The main difference occurs when the incumbent has one-sided benefits of control. In this case, it is optimal to set the proportion at the lowest value of 50 percent, since this minimizes the chance of the incumbent team maintaining control. Their paper thus provides some rationale for the use of a single class of equity with control requiring a majority of the votes.

Harris and Raviv (1988a) also consider the optimal allocation of voting rights and dividends to securities. Although the details differ somewhat, the framework is similar. One of the main differences between the papers is in the focus of the analysis. Grossman and Hart consider arrangements that are privately optimal as far as the original entrepreneur who designs the charter is concerned; they do not consider a criterion of social optimality, which includes the private benefits accruing to the incumbent and rival management teams. In contrast, Harris and Raviv do explicitly distinguish between private and social optimality.

Harris and Raviv show that one-share, one-vote majority rule is socially optimal since it ensures that the management team that generates the greatest total amount (including payouts to shareholders and private benefits to managers) controls the firm. This is because the arrangement allows the team that can pay the most to gain control; any deviation gives an advantage to the incumbent or rival that may allow them to gain control even though they generate a lower total amount. The arrangement that is privately optimal for the original owner involves issuing two extreme classes of security, one with all the voting

rights and one with all the dividends. The reason this is optimal is that it allows the securityholders to extract as much of the benefits of control from the management teams as possible because it forces them to compete for them. Thus, in general, the rules that are privately and socially optimal are not the same.

Grossman and Hart obtain one-share, one-vote majority rule as privately optimal, whereas Harris and Raviv obtain issuing extreme securities as privately optimal, because of differences in their assumptions. Among other things, the two papers are concerned with different parameters for the benefits of control the incumbent and rival can capture. Grossman and Hart argue that the case where both have benefits of control is of little empirical interest, whereas Harris and Raviv do not make this restriction. If the private benefits for both incumbent and rival are high, concentrating votes among a small class of equity is optimal in the Grossman and Hart model.

In the cases where only the rival or only the incumbent obtains benefits of control, both one-share, one-vote majority rule and extreme securities are optimal arrangements in the Harris and Raviv model. Extreme securities are optimal in these circumstances in their model but not in Grossman and Hart's, because Harris and Raviv assume that each investor can construct an optimal portfolio containing both of the extreme securities and that each investor's tender decision can be pivotal. This means that investors take into account the effect of tendering their votes on the value of their nonvoting shares. In contrast, Grossman and Hart assume each investor ignores any effects his actions may have on the outcome of the tender.

These differences between the assumptions and results of the two papers raise a number of issues. The private optimality of firms issuing equity with one share, one vote apparently depends critically on the assumption that the private benefits of control of the incumbent and the rival are asymmetric. If both have significant benefits, then concentration of votes appears to be (privately) desirable. If this type of theory is to explain the predominance of one share, one vote, it is necessary to provide some theoretical or empirical justification for why asymmetric private benefits of control is a plausible assumption. A priori, one might expect private benefits would be symmetric, since the limitations on the amounts managers can capture are set by corporate law and other factors that are the same for both incumbents and rivals. The main private benefit that can differ is, perhaps, the psychic satisfaction of control. An important question empirically is, therefore, how much this does differ between incumbents and rivals. Another issue is the best way to model shareholders' decisions; in particular, in close contests do they in practice regard themselves as unimportant in influencing the outcome, or pivotal?

Blair, Golbe and Gerard (1989) consider a model similar to that of Harris and Raviv (1988a) in that they are concerned with social optimality and both the rival and incumbent have private benefits of control, but these authors obtain rather different results. They are able to show that, in the absence of taxes, one-share, one-vote majority rule and extreme securities that unbundle voting rights and cash flows are equivalent and both lead to social optimality. In contrast, Harris and Raviv show that only one-share, one-vote majority rule is socially optimal; extreme securities can lead to suboptimal outcomes. The reason for this difference is that Blair, Golbe and Gerard assume the rival and incumbent bid simultaneously, whereas Harris and Raviv assume they bid sequentially. Again, this difference in approaches and its effect on the results raises the question of which is the most appropriate way of modeling the situation.

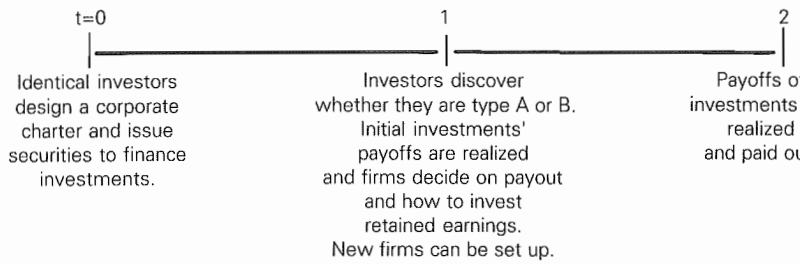
The main concern of Blair, Golbe and Gerard is to consider the effect of capital gains taxes on the allocation of voting rights and cash flows. If capital gains taxes are in effect, then welfare is improved if extreme securities are used. This is because a lock-in effect means capital gains taxes may prevent a superior rival from winning if there is one-share, one-vote majority rule; tax liabilities may be higher when the rival wins than when the incumbent wins. Allowing separate trading of votes alleviates this effect.

Taking the security structure of voting equity and debt as exogenous, Harris and Raviv (1988b) stress the importance of capital structure for takeover contests, because high leverage allows a controlling interest to be acquired for a low outlay. Harris and Raviv (1989) combine this idea with the approaches in Grossman and Hart (1988) and Harris and Raviv (1988a) by considering the allocation of voting rights and cash flows when the firm is not restricted to issuing just equity. They use a similar model to that of Grossman and Hart. In particular they focus on privately optimal securities, only the incumbent (or the rival) is assumed to have private benefits of control, and each investor ignores any effect his actions may have on the outcome of the tender.

The problem of the entrepreneur who owns the firm initially is to design securities that prevent the incumbent management that has private benefits from maintaining control when a superior rival appears. This means that the cost of resisting takeovers must be maximized. As in the papers focusing only on equity, one share, one vote among voting securities is an important component of this, since it means that control cannot be acquired cheaply by the party with private benefits. In addition, they show that nonvoting risky securities should not be sold to outside investors; if nonvoting securities are sold to outside investors, they should be risk-free debt. The reason is again that these maximize the cost of obtaining control and so tend to favor the superior rival.

Figure 4

The Sequence of Events in the Bagwell and Judd (1989) Model



The private optimality of one share, one vote in Harris and Raviv (1989) again appears to depend on the assumption of asymmetric benefits of control between the incumbent and rival. If both had private benefits of control, extreme securities of some sort might be optimal as in Harris and Raviv (1988a). An interesting issue is whether debt and equity remain optimal in this case.

The models to analyze the design of equity that have been considered above are all concerned with the effect of voting when an incumbent management team is challenged by a rival team. Bagwell and Judd (1989) take a different approach by considering the optimality of majority rule where control is concerned with payout and investment decisions.

The sequence of events in their model is shown in Figure 4. Initially all investors are identical; they design corporate charters and issue securities to finance firms' investments. At time 1 investors discover whether they are type A or B. Type As value consumption at time 1 and time 2 and require a minimum level of consumption at time 1. Type Bs only value consumption at time 2 and are less risk averse than type As at that time. Just after investors' types are discovered, firms decide on how much of the cash generated by the initial investment to pay out to shareholders and whether to invest the retained earnings in a safe or a risky project. If investors have any cash remaining at time 1 they can invest it in new firms. At time 2, the final payoffs from firms' investments are realized and paid out to shareholders.

A crucial feature of Bagwell and Judd's model is the existence of transaction costs for trading securities at time 1 after investors have discovered their type. The particular cost that is modeled is the capital gains tax. In the absence of this cost, investors would simply reallocate their portfolios. Type A investors would choose firms that pay out their required consumption at time 1 and invest in relatively safe projects and type B investors would choose firms that invest all their time 1 earnings in risky projects. When this type of rebalancing is prohibitively costly, each firm will have shareholders with different views about its optimal policy and control will be important. For example, suppose there is majority rule and type As are just in the majority. In this case they will prefer dividends to share repurchase even though the former strategy involves a higher tax burden, because this allows them to maintain control and implement the investment choice they prefer.

Bagwell and Judd show that the optimal decision rule in the corporate charter depends on the level of these transaction costs for rebalancing at time 1. For small transaction costs, majority rule is optimal because investors can rebalance at low cost and not much shareholder diversity is found among firms. However, for transaction costs that are so high that no rebalancing occurs, majority rule is not optimal. In this case the corporate charter should specify that the firm's policy is chosen to maximize a welfare function where the weights assigned to each type correspond to their representation in the firm at time 1. This maximizes investors' welfare initially since they only know the probability of being a particular type.

Bagwell and Judd's model illustrates that control may be important in situations other than takeovers. They focus on a particular situation of this type. One issue is in what other circumstances control matters. Another is how important empirically each of these possible scenarios is in influencing the design of corporate charters.

Overall, the papers considered in this section indicate circumstances do exist where debt and equity are optimal. However, these circumstances appear to be rather special relative to the wide set of circumstances in which debt and equity are used in practice. Thus the contribution of the literature to date is to provide some insights into why debt and equity are used, rather than a single comprehensive theory. The literature has also succeeded in identifying a number of important issues and has provided paradigms within which to consider these issues.

What Are the Optimal Securities?

As mentioned above, the circumstances so far identified where debt and equity are optimal are fairly restricted. In particular, most of the

papers mentioned require that the firm or its investors or both be risk neutral. Since it has traditionally been argued that one of the main roles of the stock market is to allow risk to be shared, this assumption is fairly restrictive. Moreover, the long history and extent of financial innovation suggest that firms' financing needs are not satisfied by debt and equity.

Rather than ask "What are the circumstances where debt and equity are optimal?" another branch of the literature has been concerned with the question "What are the optimal securities to issue?" The Modigliani and Miller result, that capital structure is irrelevant when markets are complete, suggests that the form of securities issued is also irrelevant in these circumstances. In order to develop a theory of optimal securities, it is necessary that markets be incomplete. One possible reason for incompleteness that is often suggested is transaction costs. Allen and Gale (1988; 1989) have considered the implications of the transaction costs of issuing securities.

Allen and Gale (1988) develop a simple model of financial innovation with two dates and a finite set of states of nature. Information is symmetric; the state is unknown to everybody at the first date and revealed to all at the second. A single good exists at both dates, along with a finite number of investor and firm types with a continuum of each type. Instead of assuming that firms are restricted to issuing debt and equity, however, Allen and Gale assume that firms choose the securities that they issue and this determines the transaction costs they incur. This means the market structure is endogenous and it is possible to consider the theoretical issues raised by financial innovation.

The equilibrium concept used is based on that of Hart (1979) and is essentially Walrasian. Markets are perfectly competitive since there is a continuum of firms and consumers. Prices are quoted to both firms and investors for every possible security. This includes all those securities that are issued in equilibrium as in Hart's model. It also includes all those securities that could be issued but in equilibrium are not (that is, demand and supply are both zero). This contrasts with Hart's approach where markets for these unissued securities are closed to investors and prices are quoted only to firms.

The first result obtained is that under standard assumptions equilibrium exists provided short sales are not possible. If securities can be costlessly sold short, then equilibrium may not exist because short-sellers are effectively able to expand the supply of firms' securities more cheaply than firms can. For example, suppose a firm can issue two securities rather than one for some additional cost. In order for the firm to be willing to do this, its gross value with two securities must be larger than with one to allow it to recoup this additional cost. However, if costless short sales are possible this implies an arbitrage opportunity is available, since by going short in a two-security firm and long in a

one-security firm, an investor can earn the difference between the two. An equilibrium where all firms issue one security may not be feasible because at the prevailing prices issuing two securities may be profitable. Thus equilibrium may not exist unless short sales are ruled out.

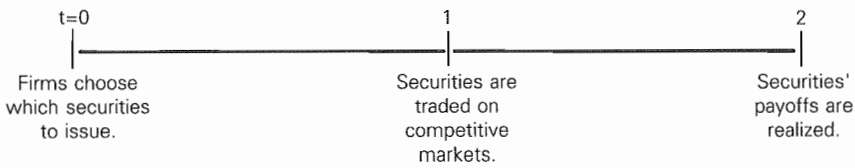
The short sales constraint means that with incomplete markets distinct types of investor value securities differently on the margin. The price of a security, whether issued or unissued, is determined by the group that values it most. In equilibrium, the firm issues the securities that maximize its value and sells them to the groups or clienteles that value them the most.

The second result obtained is that every equilibrium is constrained efficient. In other words, a planner subject to the same transaction costs for issuing securities and able to make transfers between investors at the first date cannot make everybody better off than in the market allocation. This result arises because of the assumption that the prices of unissued securities are quoted to both firms and investors. If prices are only quoted to firms, then inefficient equilibria may exist because of a pecuniary externality. To see this, suppose there are two types of firm, each of which produces output in one state only. Investors have Cobb-Douglas utility functions so that consumption in one state will not have value unless consumption is positive in the other. If markets for unissued securities are closed to investors, an equilibrium exists where the firms do not issue any securities because the price quoted to them for all securities is zero. This cannot be an equilibrium if prices are quoted to investors as well, because at zero prices they would demand securities that allow them to consume in both states.

A third result is that debt and equity are not optimal but that the optimal securities do have a particularly simple form. To see this, suppose there are two types of investor, one type of firm and two states. When firms issue only equity, the more risk-averse investors have a lower marginal utility of consumption in the high-output state than the less risk-averse investors; in the low-output state, the reverse is true. If a firm issues debt and levered equity, the more risk-averse group will pay a premium for the debt since it allows them to smooth consumption; the levered equity will be held by the less risk-averse group since they value consumption most in the high-output state. This split is not optimal, however, because the debt allocates payoffs in the good state to the more risk-averse group that values consumption the least. The firm could obtain more for its securities by allocating all the payoffs in the good state to the security that is held by the less risk-averse group, which values consumption most in this state. In general, it can be seen that optimal securities involve allocating all the firm's output in a particular state to the security held by the group that values consumption most in that state.

Figure 5

The Sequence of Events in the Allen and Gale (1989) Model



The critical assumption for all these results is the one ruling out short sales. In practice, short selling of corporate securities is costly and only a limited amount is undertaken (Pollack 1986). This suggests that in some circumstances it may be appropriate to rule out short sales. However, markets for stock options and index futures may represent a low-cost substitute for short sales. This suggests that the case of unlimited short sales is also of interest. In addition, the fact that unlimited short sales is a crucial assumption of many models in financial economics means this case is important theoretically.

Allen and Gale (1989) develop a model where unlimited short sales are possible. The main differences between this model and the one in Allen and Gale (1988) are that the number of agents is finite and the sequence of events is as shown in Figure 5. Firms first choose the securities to issue, these securities are then traded on competitive markets, and finally the securities' payoffs are realized. When choosing securities initially, firms play a noncooperative game; they take into account the effect of their actions on the equilibrium of the securities market at the next stage.

In contrast to the model of Allen and Gale (1988), firms are not price-takers; if a firm issues a new security it changes the security market equilibrium. Nevertheless it can be shown that if short sales are ruled out, then as the number of agents approaches infinity the equilibrium is essentially equivalent to that in Allen and Gale (1988); each firm's actions have a negligible impact on the equilibrium at the second stage.

If short sales are *not* ruled out, the equilibrium of the model may

differ significantly from that in Allen and Gale (1988). Even if the value of a two-security firm is the same as that of an identical one-security firm, so that no arbitrage opportunity exists in the second-stage equilibrium, a firm may nevertheless have an incentive to issue a costly security initially. A new security may increase the value of the firm in the second-stage equilibrium relative to the equilibrium that would occur if no innovation were made. Thus there can be an ex ante incentive to innovate even when there is no ex post incentive. This is true even as the number of agents approaches infinity. Now a single firm can affect the security-market equilibrium even though it is negligible, because the existence of short sales means that the open interest in the security may be large.

The fact that firms are no longer price-takers ensures that the existence of equilibrium is not a problem even though short sales are possible. However, the equilibrium is no longer constrained efficient. An example is given of too little innovation; the change in firm value across security-market equilibria is such that firms fail to issue a security even though everybody could be made better off if such a security were issued and appropriate initial transfers were made. An example is also given of too much innovation; in this case firms issue securities even though everybody could be made better off if fewer securities were issued. In the context of this model, therefore, the endogenous incomplete market structure that arises from profit-maximizing behavior is not necessarily efficient. Another aspect of this result is that the equilibrium with short sales ruled out may be superior to the equilibrium where short sales are not ruled out. For a given set of securities, allowing short sales improves possibilities for risk sharing. However, allowing short sales reduces the incentives to innovate, so overall risk-sharing opportunities may be reduced.

As far as the form of optimal securities is concerned, an example is given where debt and equity are optimal. This example is clearly a special case, however, and in general the optimal securities have a complex form that cannot be characterized simply.

This section has considered models of financial innovation where corporations issue securities. However, in addition to corporations a number of other types of institution such as futures and options exchanges issue securities. Duffie and Jackson (1989 and the references therein) consider innovation by futures exchanges; Allen and Gale (1990) consider innovation by options exchanges. The implications of incomplete markets for the design of government securities are considered in Gale (1989).

As with the literature on the optimality of debt and equity, the literature on optimal securities is still at a very early stage. The results in Allen and Gale (1988), showing that optimal securities involve allocating

all the firm's payoffs in a particular state to the security held by the group that values consumption the most, provide some insight into the option-like form of many new securities. However, the literature to date does not provide much insight into the actual path of most financial innovations. Its main contribution is again in identifying the theoretical issues and in providing models to analyze these issues.

Summary and Conclusions

The traditional approach to understanding firms' choice of capital structure has been to consider firms' optimal debt-equity ratios. This approach has not been very successful in terms of providing an understanding of the capital structures firms choose in practice. The introduction of many new securities in recent years suggests the alternative approach of considering the optimal form of securities that firms should issue. The literature based on this approach has been the subject of this paper.

The first branch of this literature has considered the circumstances in which debt and equity are optimal. A number of situations where debt is optimal have been identified. These typically involve a principal-agent relationship where an investor (the principal) lends money to an entrepreneur (the agent) to allow him to undertake an investment project. A debt contract is optimal in these models because it ensures that the entrepreneur takes a particular action. Although these theories are suggestive of why a public corporation may want to issue debt and equity, they cannot be directly applied in this case. Williams (1989) has extended this type of analysis to public corporations by assuming ex ante monitoring that prevents managers from expropriating firms' assets.

The assumptions of all these models are fairly restrictive. It is usually critical that either one or both parties is risk neutral and/or the earnings from the investment or actions of the entrepreneur are difficult for the outside investor to observe and so cannot be contracted upon. If earnings or anything else related to the management's performance can be observed at all, and the management is risk averse, the results of Holmstrom (1979) suggest that the optimal payments to the bondholder should be conditioned on this information. In practice, even though typically the parties are risk averse and some information on earnings is available, payments on debt contracts are fixed and do not vary with the available information. An exception is provided by income bonds but these are rarely used.

Another part of the literature has looked at the question of why public corporations typically have equity securities with one vote per

share and majority rule. Most of these papers are concerned with the effect of voting on the market for corporate control. Again, the circumstances where these results hold are rather special. Moreover, they critically depend on the magnitude of the private benefits of control and the distribution of these between incumbents and rivals.

Overall, the literature on the optimality of debt and equity suggests that the circumstances in which these commonly used securities are the best are fairly restrictive. This is difficult to reconcile with the fact that debt and equity are so widely used. However, the literature has identified a number of important issues and identified ways to think about these issues. A similar argument can be made concerning the literature on the form of optimal securities.

The results to date do suggest a number of important questions to be investigated in future research. Debt and equity have been used in numerous diverse situations. Why is it that they are so robust? What are the incentives for firms to issue securities other than debt and equity, and what are the general principles underlying the design of these securities? Finally, even though the securities that are issued may be optimal privately, the results of Harris and Raviv (1988a) and Allen and Gale (1989) suggest that no particular reason exists to believe that they are optimal from a social point of view. In other words, as far as the issue of securities is concerned, it is not immediately obvious that the "invisible hand" operates and ensures that market structure is efficient. A critical issue is, therefore, under what circumstances the market structure that arises is socially desirable and under what circumstances government intervention is justified.

The papers considered above all assume discrete time. The use of continuous time models to price derivative securities has not been discussed. As Hakansson (1979) has pointed out in the context of option securities, these models rely on the fact that dynamic trading strategies make markets effectively complete. This makes the analysis of financial innovation using continuous time techniques difficult. However, Merton (1989) has made progress in this direction by considering a world where individuals face transaction costs but intermediaries do not so that continuous time techniques can still be used. The relationship between financial innovation and dynamic trading strategies is an important topic for future research.

In conclusion, the theoretical literature has just begun to look at the question "What are the optimal securities for firms to issue?" Recent research has shed some light on the changing nature of debt and equity by identifying some of the important issues in this area.

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Discussion

*Oliver D. Hart**

Discussing a survey of the literature is never an easy task. In this case the task is made harder by the fact that (a) this survey is very good; (b) (perhaps because of this) I agree with a large proportion of what Franklin Allen says. In fact, probably the only disagreement we have concerns the assessment of the strengths and weaknesses of a recent body of work that tries to analyze the optimality of debt and equity arrangements. Allen believes that this work relies on rather restrictive assumptions—risk neutrality of management, unobservability of corporate earnings—and that current models can explain the existence of debt, but not of equity as well. In contrast, I believe that the results of these models are a bit more robust than Allen suggests. I will devote the rest of my discussion to explaining why I think this is so.

My main point can in fact be summarized very easily: it is that debt and equity are not just two out of a huge universe of potential financial instruments, with the puzzle being why firms select them, rather than the others, so much of the time. Rather I believe that debt and equity have some quite special features, which make their selection (or the selection of some variants) less surprising.

My starting point is the idea that in a world of transaction costs where individuals can contract at best imperfectly over the uncertain future, asset ownership matters. In particular, the owner of an asset has residual rights of control over that asset; that is, the right to decide how the asset should be used in any way not inconsistent with a prior contract, custom, or any law (Grossman and Hart 1986). For example,

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the owner of a machine can typically decide who has access to it, the owner of a production line can decide at what speed it runs, and so forth.

As far as I can see, equity is just another name for ownership: the equityholders of a firm collectively have the right to determine how the firm's assets should be used—in particular who should manage them, or, to be more precise (through the choice of a board of directors), who should oversee their management. Ownership is like any other economic good: there is an efficient allocation of it. It is not difficult to see, for example, that if a single agent 1 takes actions that cause an asset A to be productive (agent 1 might learn how to operate it, say), then it will often be efficient for 1 to own A. In particular, if some other agent 2 owns A, then 2's ability to exclude 1 from access to A may diminish 1's return from his asset-specific activities, thus causing him to underinvest in these. On the other hand, if several agents take actions, each of which has a positive payoff in conjunction with A, then some form of shared ownership (for example, a partnership) may be optimal, since this will allow each agent to receive at least some return on his activities (Hart and Moore 1988).

Sometimes a single-ownership arrangement, even though it may be efficient, will not be feasible. For example, suppose agent 1 is the only agent who causes asset A to be productive—and therefore on efficiency grounds 1 should own A. It may be the case that 1 does not have the funds to buy A (asset A may initially be owned by somebody else, or A may not have been constructed yet). Under these conditions the best arrangement may be for agent 1 to borrow the funds necessary to buy A. What this means is that 1 owns and controls the asset unless he (or she) fails to repay his loan: in this event, the creditor has the right to seize the asset, that is, the residual rights of control shift to the creditor.[1] The advantage of such an arrangement is that agent 1 still has an incentive to take actions that increase the asset's productivity since he benefits from these in non-default states, but at the same time agent 1 is given a strong incentive to repay his loan. In particular, such an arrangement may be superior to one in which the creditor owns the asset from the beginning and employs agent 1 to work with it. (Under these conditions, agent 1 will on average get a smaller fraction of any productivity increase.)

The situation just described is one where a liquidity-constrained "manager" raises funds from a single investor-creditor. However, in many cases, several investors will finance the asset's purchase. The manager could again borrow from each of them. Now, however, it is

[1] This is under the assumption that the loan is secured by the asset.

necessary to specify more carefully what happens in a default state. Obviously, it is impossible for residual control rights over the asset to shift to each creditor. Instead, each creditor could be given the right to foreclose on some fraction of the asset (if it is divisible) or the right to sell the whole asset and divide up the proceeds on a pro rata basis (if it is not).

An alternative to borrowing from several investors would be for the manager to issue equity in the asset, that is, to give each investor control rights or votes in the asset from the beginning. Again a variety of arrangements is possible, depending on the power each equityholder has to act alone. In the case of a divisible asset, one could suppose that each equityholder has the right to liquidate his pro rata share of the whole asset at any time (open-ended mutual funds are set up in this way). In the case of an indivisible asset, however, it is more natural to suppose that some degree of consensus is required before the equityholders can act; for example, that it takes a majority to unseat management (or the board of directors). The latter is, of course, the standard practice in public corporations.

Many other arrangements are possible in addition to pure debt and pure equity. One obvious one is for the firm to issue combinations of debt and equity. Another is for the firm to issue various hybrid securities. For example, the firm could promise to hand investors either a fixed amount of money or a certain fraction of equity at a future date, with the choice being up to the firm (preferred shares are defined in this way); or the firm could issue debt that can be converted into equity at the investor's discretion (convertible debt); or it could issue options—that is, sell investors the right to purchase future equity in the firm.

Such arrangements all involve possibly contingent exchanges of equity (current or future) for cash (current or future). In this sense they can be regarded as variants of debt and equity; or to the extent that debt is itself just a particular type of contingent equity claim (the creditor gets either cash or an ownership claim in the future depending on whether the debtor defaults), as variants of equity itself.

So far I have spoken entirely about the votes or control rights that accrue to equity. Of course, each equityholder also has the right to his pro rata share of any dividends the firm pays. However, to the extent that dividends are at management's discretion—as they typically are—this right almost goes hand in hand with the residual right of control over assets, where assets now include any cash the firm disburses (over and above cash that has been committed to others).

Nothing that I have said so far about the special features of ownership, and various claims written on it, seems to depend on particular assumptions about manager or investor attitudes towards risk. Nor do I think the ideas would be much changed if some aspect of

the firm's performance, such as earnings or profits, could be verified. Under these conditions, the firm's payment to creditors could be chosen to be some function of performance. However, this simply gives rise to contingent debt; or, if default provides investors with the right to acquire equity rather than the right to foreclose on assets, to contingent preferred shares. Conceptually, I see little difference between contingent debt or preferred shares and their noncontingent counterparts.

In particular, it is worth stressing that the verifiability of earnings and profits does not eliminate the rationale for equity. It is true that with earnings and profits verifiable, management can be put on some sort of incentive scheme. Given that the firm has assets, however, it will still matter who has control over these. For example, regardless of the incentive scheme, a situation where outside investors are the equity-holders and can fire management (or the board of directors), perhaps with compensation, and hire a new management team to operate the assets, is very different from a situation where management owns the equity and can veto any management change. Moreover, the incentive scheme itself can be thought of as part of the firm's financial structure; it is just a contingent debt from the firm to management (the firm owes management a sum of money as a function of the profit level realized).

Franklin Allen might accept much of the above, but argue that even though the theory survives the extension to verifiable profits or earnings, the real question is why we do not see in practice the types of contingent debt or equity that such an extension suggests we should. This is similar to the question of why (arguably) we do not see the highly nonlinear incentive schemes that principal-agent theory predicts, and I don't have a good answer to it.[2] I can, however, give *an* answer. It may be the case that those variables that would impart useful information about managerial performance—and on which we would like financial structure to be contingent—are costly to observe and verify, while those variables that can be verified more easily are not that informative. Earnings or "profits" seem to be examples of relatively uninformative variables since they are open to a good deal of manipulation by management. Allen argues in his conclusion that, by a result of Holmstrom, even a variable that is only slightly informative should (almost always) be included in an optimal incentive scheme or as part of an optimal financial structure. However, as far as I know, this is true only if management's actions are unidimensional, which is not the case if management can, say, divide its time between leisure, making profit, and manipulating the accounts. Under these conditions, making the

[2] Not all principal-agent models predict complex schemes, however. See, for example, Holmstrom and Milgrom (1987).

manager's salary (or financial structure) sensitive to earnings may be positively undesirable since it may cause him to devote too much time to manipulation. In addition, Holmstrom's result is no longer valid if observation of additional variables is costly. Thus, it may not be so surprising after all that most debt is not contingent.

In conclusion, I believe that recent work on optimal financial structure has more robust foundations than might be apparent at first sight. We are still a long way from a theory that can explain the simultaneous use of debt, equity, preferred shares, and the like, but I believe that the control rights approach does offer some hope for the development of such a theory in the future.

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Discussion

*Robert C. Merton**

I agree with Oliver Hart that Franklin Allen's survey article covers the literature rather well. Hart, as I hoped he would, has discussed in detail some of the specific theoretical papers to which Allen refers. I would, however, briefly mention two relevant theories that were not explicitly discussed by either Hart or Allen. One is the work of Oliver Williamson on so-called transaction cost economics, as perhaps an alternative to agency theory, wherein the unit of analysis is the "transaction" rather than the "firm." The other is some work that my colleague Carliss Baldwin has done over the years, which I (not she, perhaps) would characterize as the "strategic capital" theory. This second theory may be illustrated by two examples. First, a dominant firm in an industry may not have as much debt as, say, tax theory would suggest, because by having more equity capital, the firm can credibly threaten to cut prices and suffer losses in order to deter competitors. Second, consider a firm bargaining with another strong entity such as a union. By carrying substantial debt, the firm can reinforce its bargaining position by threatening to shut down, should the union insist on too great a wage settlement or on employment contracts that, in conjunction with the debt, are too burdensome. Perhaps names of some companies will come to mind that, in the past year or so, have assumed considerable debt, suffered huge losses, and now appear to be using the threat of bankruptcy to renegotiate employee labor contracts.

Before discussing the debt-equity question, I would like to reinforce

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Allen's observation that many of the financial innovations of the last two decades, although heralded as novel, were not entirely new. Consider, for example, exchange-traded stock options and futures contracts. In the seventeenth century, options and contracts resembling futures accounted for the bulk of transactions on the Amsterdam stock exchange, which at the time was the financial center of the western world. Moreover, from the accounts given by Joseph de la Vega (1688), it appears that the concerns raised about these contracts in Amsterdam at that time (for example, insider trading, manipulation, excessive speculation and price volatility, and default risks) are much the same as those expressed about options and futures trading today. It is perhaps not surprising that as we resurrect ancient financial instruments, we revisit ancient financial problems.

My contribution to this session is essentially a negative report. I would suggest that promising explanations of why nonfinancial business firms issue the variety and mix of debt and equity instruments that they do are probably not to be found on the "demand-side" for these securities. That is, other than for financial intermediaries, the firm's choice of capital structure should not rest on the tastes of investors and theories of investor risk-sharing. As I have discussed elsewhere (Merton 1989; 1990, Chapters 14–16), finance theory in the context of well-developed financial markets would largely rule out nonfinancial business firms issuing a variety of financial instruments solely to satisfy the risk-sharing needs of investors. Financial intermediaries and specialized "zero-supply" markets (for example, futures and options) can meet these needs more efficiently. Thus, such a priori reasoning implies that the issuance of multiple types of financial instruments by business firms is not driven by the demand side of the market for these securities. Hence, one should look to the supply side (for example, corporate tax, regulation, and agency issues) for explanations of this issuing activity.

In further elaboration on this point, business firms need not issue instruments other than equity in order for investors to achieve an efficient blend of risk and returns in their portfolios. For example, if a business firm issues only shares, a separate entity like a mutual fund, a financial intermediary, or a holding company could acquire these shares as assets and finance their acquisition by offering investors various claims with payoffs contingent on these shares. Such partitioning of the payoffs could, for example, emulate the payoffs to "junk" bonds. Collateralized mortgage obligations and collateralized bond obligations are examples of such intermediation.

By using intermediation in this fashion to separate a business's operations from its financial structure, the system permits investors to acquire the instruments they demand while insulating the operations of the businesses from any defaults on these instruments. This separation

essentially permits "no-fault default." For instance, suppose an intermediary issues two securities against the shares of a firm. The first promises to pay a fixed amount in, say, two years; the second is a residual claim against the value of the shares. In the case of a default, the intermediary turns over the assets of the firm to the holders of the first type of security. Thus, the first security has essentially the same structure as junk debt, but without the prospect of bankruptcy costs. This arrangement allows for all the demand-driven risk-sharing entailed by junk debt, but in the case of a default, the company's operating management is not influenced a whit. I would suspect that most policy-makers who are worried about default, especially on junk debt, are not worried about some investors failing to be paid in full; what they are really worried about is a failure of the financial system and broad disruption of the real sectors of the economy, due to the effects of widespread default on business operations.

The separation of financial structure from business operations is not just hypothetical. This separation already functionally exists in the options market. The expiration unexercised of a call option on a stock is equivalent to a no-fault default. I have not seen these option expirations trigger any response from managements of the underlying firms or anyone else. Another example of this separation is the Americus Trust structure, which funds a trust with shares of a company's stock (for example, DuPont) and finances the share purchases by issuing two types of securities called "primes" and "scores." The prime is entitled to all dividends on the stock and a fixed payment at maturity of the trust. The score receives the residual value, if any, at maturity of the trust. The prime security is functionally equivalent to a junk bond on a highly levered firm with operations the same as the underlying stock.

Investors' behavior also suggests that it is very unlikely that theories of risk-sharing are crucial for explaining the financial strategies and capital structures of businesses. I think that the evidence shows that given a choice, investors are really more concerned with controlling the risk of their portfolios than with controlling the risk of the individual securities that constitute their portfolios. Option contracts on individual stocks, for example, initially were traded very actively, but after options on portfolios of stocks were introduced, the volume and use of individual options dropped dramatically.

Not only does the separation of the business operations from its financial structure make possible no-fault default, it also reduces the moral hazards that arise when management is beholden to only a subset of the firm's investors (that is, its stockholders as distinct from its creditors). Management, when it is disconnected from the firm's financial structure, has no particular reason to choose a dividend policy or any other financing or investment strategy that benefits one group of the

firm's liability holders, equityholders, while injuring another group of its liability holders, such as the firm's creditors. Consequently, the separation of the business from its financial instruments seems to be compelling in almost every respect if the only role for such instruments is the efficient sharing of risk among investors.

I believe, however, that an adequate theory of business behavior must consider liabilities that do not appear on business balance sheets as well as those formal financial liabilities that do. Accordingly, not all liabilities can be managed by an intermediary distinct from the business. For example, a firm's obligations to customers, suppliers, and employees entail risk-sharing. If customers have long-term, unfulfilled contracts with a company, these contracts become liabilities just like debt. I would suspect, however, that this type of liability would be less significant for companies with relatively generic and nondurable products. If you buy Kleenex tissues and Kimberly-Clark goes out of business, you are not worried that you will fail to obtain facial tissues elsewhere. But if you invest heavily in software that works only on one kind of computer, then discontinuance of warranty and hardware support for that computer can be very costly.

Finance theory already provides powerful tools for analyzing the complex financial instruments to which Allen and Hart allude. For example, the tool of contingent claims analysis (see Merton 1990, Chapters 11–14) permits one to convert each of the complex securities issued by firms into an equivalent portfolio of unlevered equity and short-term, default-free debt. By making this conversion for each security, one can thereby compare the risk profiles and functional roles of seemingly quite different types of financial instruments.

Theory can also help us distinguish important policy issues from those that are not. For example, most observers would agree that the levering of corporate America during the past decade has caused both corporate debt and equity returns to become more volatile. This observation has often been used to conclude that such levering has increased the riskiness of American firms. Theory tells us that the riskiness of both debt and equity increases with a corporation's leverage, but paradoxically the riskiness of the whole firm's value (that is, the sum of debt plus equity) may not change at all and may even decline. Consequently, when the returns on equities and debt are described as being more volatile than before, one cannot infer anything about firms as a whole being more risky. Similarly, one can ask whether institutional investor portfolios of debt and equity have become more risky. Debt and equity returns, taken separately, are almost surely more risky today than in the past. But, debt returns today are less volatile than equity returns in the past. And, institutional investors now hold more corporate debt relative to equity than they did. Thus, it is entirely possible that their total

equity-cum-corporate-debt portfolios are no more risky today than they were five or ten years ago. Essentially, these large investors are, in total, holding the same underlying assets that they did before, but their separate financial claims are just packaged differently.

In closing, a word on future empirical work: During the past generation, finance has relied on large sample-size, generic data bases (for example, stock and bond market prices) as the core for testing hypotheses. However, I think that in the future many of the issues surrounding business financial behavior and risk sharing will be resolved using smaller sample-size, specialized data bases gathered through good field work. For example, as we all know, there is a signalling theory for explaining dividend policies of firms. Although stock market data support this theory to a degree, these data support alternative theories as well. We might resolve this issue in large part by interviewing one hundred or more boards of directors to discover how much time they spend on setting the dividend and what factors they considered in making their decisions. More generally, such field work might help distinguish among the alternative theories of optimal security design discussed in Allen's paper.

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The Changing Nature of Debt and Equity: A Legal Perspective

*Charles P. Normandin**

Historically, the law has distinguished sharply between debt and equity, and between the duties a corporation owes to its stockholders and those it owes to holders of its debt securities and its other creditors. Over the past several years, changes in the business world, particularly the increase in leveraged buyouts and the use of nontraditional forms of securities, have put a strain on the traditional legal analysis. This paper will briefly examine the legal principles that historically have applied both to solvent corporations and to those that are insolvent and undergoing reorganization under the Bankruptcy Code. It will also explore how the courts are attempting to cope with the new problems, and the difficulties the courts face in applying traditional principles to solving those problems.

Traditional Analysis—The Solvent Corporation

The duties of a solvent corporation and its management to its stockholders are fiduciary in nature. They are both very broad and very general. Management is required to operate and manage the business of the corporation with care and with due regard to the interests of the stockholders. However, holders of common stock typically do not have the right to require management to take specific action, and management enjoys considerable discretion in determining what action is in the

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best interests of stockholders, and in balancing long-term and short-term interests.[1]

The duties of a solvent corporation and its management to creditors are primarily contractual in nature. These duties are specific, not general, and are spelled out in detail in the loan agreement or indenture under which credit is extended. The loan agreement or indenture will also state in specific detail the remedies to which creditors are entitled if the corporation breaches its contractual obligations. The corporation also must comply with statutory provisions restricting payment of dividends and redemptions or repurchases of its stock, and with state fraudulent conveyance law, and these laws may provide some further protection to creditors. These statutory provisions are again quite specific in nature, however, and usually will apply only when the corporation is either insolvent or approaching insolvency. A solvent corporation and its management have not traditionally been thought to have any general fiduciary duties to its creditors.[2]

The traditional legal analysis was based on certain unstated underlying assumptions as to how the business world worked. The capital structure of most corporations contained a substantial equity component, which was viewed as a cushion to protect creditors from the risk of insolvency. The debt to equity ratio of corporations engaged in a particular type of business did not vary greatly, and was generally moderate. Creditors accepted a fixed rate of return, with little prospect for appreciation, in return for a priority in right to payment over stockholders on the corporation's liquidation or insolvency. Debt instruments were regarded as having low risk, as compared to stock. What risk did exist fell into one of two categories: market rate risk or credit risk. The former was, for the most part, a risk that the corporation and its management could not influence or control.[3] Increased credit risk could result either from general economic conditions affecting the corporation's business, or from mistakes in judgment by the corporation's management. Such mistakes in judgment, it was thought, would adversely affect both stockholders and creditors in a roughly similar

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[1] *Paramount Communications Inc. v. Time Inc.*, Civ. Action Nos. 10866, 10670, 10935 (consolidated) (Del. Ch. July 14, 1989) (1989 Del. Ch. LEXIS 77). "The corporation law does not operate on the theory that directors, in exercising their powers to manage the firm, are obligated to follow the wishes of a majority of shares. In fact, directors not shareholders are charged with the duty to manage the firm." P. 34.

[2] *Harff v. Kerkorian*, 324 A.2d 215 (Del. Ch. 1974), *affirmed*, 347 A.2d 133 (Del. Supr. 1975).

[3] Market rate risk is also one that is relatively easy to control or allocate through the use of specific contract provisions, such as prepayment premiums, restriction on refunding, floating interest rate provisions, and so forth. *Morgan Stanley & Co., Inc. v. Archer Daniels Midland Co.* 570 F. Supp. 1529 (S.D.N.Y. 1983).

way. If the purchasers of debt instruments anticipated that a specific action might adversely affect a corporation's credit standing, and hence the value of their securities, they could negotiate contractual provisions prohibiting or restricting such action.

These underlying assumptions as to how the business world worked were, for the most part, generally accurate through the 1970s. As a result, the courts had relatively little difficulty in reconciling the duties of a corporation to its creditors and stockholders with the reasonable expectations of investors. In the last decade, however, things began to change.

Managements began to realize that managing the corporation's financial structure might be almost as important as managing the business in determining profitability and the return to stockholders. Debt rather than equity was increasingly used to finance the corporation's operations, or to acquire new assets.[4] Even more important, debt was now increasingly associated with a leveraged buyout or other recapitalization of a corporation, rather than with the corporation's operations or the need to finance the acquisition of new assets. Leveraged buyouts were not a new discovery; they had been used for years, under different names.[5] What was new was the circumstances in which, and the purposes for which, they were being used.

In earlier years, leveraged buyouts had been used as a tool to finance a transfer of ownership when the owners of a closely held corporation died or retired, or when a corporation wanted to divest itself of a subsidiary or division. The leveraged buyout aspect of the transaction was only incidental to its main purpose. Now, leveraged buyouts were being used for the purpose of restructuring a corporation to increase its profitability and the return to stockholders, almost independent of the needs of the corporation's operation. It was also now recognized, and had not been fully recognized earlier, that the substantial increase in leverage, and the increased risks which that leverage entailed, might not affect stockholders and creditors in even roughly similar ways. A substantial increase in leverage might bring the interests of creditors and stockholders into fundamental conflict, and contractual provisions that creditors had bargained for often proved inadequate to protect their interests.

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[4] See Kopcke, Richard W. 1989. "The Roles of Debt and Equity in Financing Corporate Investments." *New England Economic Review*, July/August, p. 25.

[5] *Robinson v. Wangemann*, 75 F.2d 756 (5th Cir. 1935); Note: "Bootstrap Acquisitions: The Risk of Subordination in Bankruptcy," 48 *Boston University Law Review* 441 (1968).

The Traditional Analysis Revisited— Recent Developments

One response by creditors was to seek to reopen the issue of whether the corporation and its management owed them, as well as stockholders, fiduciary duties. These attempts failed. The courts reaffirmed earlier holdings that creditors, even creditors holding convertible securities, were not entitled to the corporate fiduciary protections enjoyed by stockholders, and that the creditors should protect themselves against self-interested issuer action by bargaining for appropriate contractual provisions.[6]

Creditors had somewhat more success with a more narrowly focused strategy. It is an established legal principle that a contract carries with it an implied covenant of good faith and fair dealing.[7] The implied covenant will prevent a party to the contract from taking action that, although not contravening any express term of the contract, would frustrate its purpose or enable the party to circumvent the clear intent of the contract.

Van Gemert v. Boeing Co.[8] involved a redemption of convertible debentures, which was challenged by holders of the debentures on the grounds they were given inadequate notice of the redemption and were thus unable to exercise their conversion rights. Boeing Co. had complied with the notice provisions contained in the debenture and the related indenture. The Court held that there was an obligation to give fair and reasonable notice of the redemption to the debenture holders, and that this had not been fulfilled despite compliance with the express terms of the indenture.

Pittsburgh Terminal Corp. v. Baltimore & Ohio Railroad Co.[9] involved a spin-off by Baltimore & Ohio Railroad Co. of the stock of a subsidiary as a dividend in kind to its stockholders. The same date was fixed for declaration of and the record date for participation in the dividend in kind. The holders of convertible debentures claimed that this deprived them of the opportunity to convert before the record date, and thus participate in the spin-off dividend. The indenture called for advance notice of certain dividends, but did not clearly call for notice for the spin-off dividend. The Court held that the Baltimore and Ohio Railroad Co. had prevented the debenture holders from receiving the informa-

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[6] *Revlon, Inc. v. MacAndrews & Forbes Holdings, Inc.*, 506 A.2d 173 (Del. Supr. 1986); *Simons v. Cogan*, 542 A.2d 785 (Del. Ch. 1987), 549 A.2d 300 (Del. Supr. 1988).

[7] See Uniform Commercial Code, 1-203; *Gilbert v. The El Paso Company*, 490 A.2d 1050 (Del. Ch. 1984).

[8] 520 F.2d 1373 (2d Cir. 1975), 553 F.2d 812 (2d Cir. 1977).

[9] 680 F.2d 933 (3d Cir. 1982).

tion they needed in order to exercise their conversion option and that this violated the implied covenant of good faith and fair dealing.

Creditors have been less successful when they were unable to relate the alleged breach of the implied covenant of good faith to a specific provision of the indenture. *Broad v. Rockwell International Corporation*[10] arose out of a tender offer following which Collins Radio Company was merged into Rockwell International Corporation and the holders of common stock of Collins Radio received $25 per share in cash. Collins Radio had outstanding convertible subordinated debentures, which were assumed by Rockwell International Corporation. A supplemental indenture provided that, following the merger, the debentures would be convertible into $25 per share of the Collins Radio common stock which would have been issuable on conversion prior to the merger. This effectively eliminated the value of the conversion right. The Court held that the elimination of the conversion right did not violate the implied covenant of good faith and fair dealing, and that the debenture holders were not entitled to a continuing conversion right into Rockwell International common stock, or to redemption of the debentures at the price provided in the indenture.

Katz v. Oak Industries, Inc.[11] involved an exchange offer and consent solicitation made by a financially troubled corporation to the holders of its long-term debt. The offer sought to exchange new securities and cash for part of the debt, and to obtain waivers with respect to the remaining debt. A bondholder argued that this was a breach of the implied covenant of good faith and fair dealing, as the corporation was seeking to do indirectly what it could not accomplish directly under the provisions of the indenture relating to redemption and waiver. The Court stated that the implied covenant should be used only where it was clear from the express terms of the contract that the parties who negotiated it would have agreed to proscribe the act later complained of as a breach of the implied covenant, had they thought to negotiate with respect to the matter. The Court found nothing in this indenture to indicate that the parties had intended to prohibit an exchange offer coupled with the giving of waivers, and refused to enjoin the exchange offer.

The most aggressive attempt by creditors to invoke the implied covenant of good faith and fair dealing arose in connection with the recent leveraged buyout of RJR Nabisco.[12] Institutional investors hold-

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[10] 614 F.2d 418 (5th Cir. 1980), *vacated*, 642 F.2d 929 (5th Cir., en banc, 1981), *cert. denied* 454 U.S. 965 (1981).

[11] 508 A.2d 873 (Del. Ch. 1986).

[12] *Metropolitan Life Insurance Co. v. RJR Nabisco, Inc.*, No. 88 Civ. 8266 (S.D.N.Y. June 1, 1989) (1989 U.S. Dist. LEXIS 6253).

ing unsecured bonds of RJR Nabisco argued that the transaction violated the implied covenant of good faith and fair dealing relating to the bonds. RJR Nabisco had sold, and the institutional investors had purchased, bonds that were "investment grade." Statements made by RJR Nabisco and its management allegedly constituted express or implied representations, not contained in the indentures, that the company intended to maintain its creditworthiness and the "investment grade" quality of its outstanding debt securities. The increased debt incurred in connection with the leveraged buyout drastically impaired the value of the bonds previously issued, and, it was argued, misappropriated the value of those bonds to help finance the leveraged buyout and to distribute a windfall to RJR Nabisco's stockholders.

The Court rejected these arguments. It pointed out that express provisions in the indentures permitted mergers and the assumption of additional debt. The institutional investors were aware of these provisions and were sophisticated investors who freely bought the bonds and could have sold them at any time. They were aware of the nature of leveraged buyout transactions and the potential problems associated therewith, and had previously participated, at various levels, in other such transactions. The Court viewed their attempt to attack the leveraged buyout as a post hoc attempt to negotiate, with the benefit of hindsight, covenants other than those that had in fact been negotiated. The covenant of good faith and fair dealing should be used to protect bargained-for rights and ensure they are performed and upheld. It should not be used to permit creditors to shoehorn into an indenture additional terms that they wish had been included.

The Court stressed the need for certainty, which would allow parties to determine what transactions were permitted or prohibited by indentures. This certainty could only be achieved by focusing on express covenants and provisions, and not by speculating on what the parties might have intended. The Court thus rejected the attempt to expand contractual provisions by relying on general statements made by the corporation or its management. The Court also noted that, if the implied covenant of good faith and fair dealing were expanded in the manner sought by the institutional investors, no standard would remain for a court to use in its efforts to define this sort of action that a corporation could take. Bondholders might ask a court to prohibit not only a leveraged buyout, but also entering into a new line of business, building a new plant, or hiring more employees, all of which might involve additional expense, debt, and risk to the corporation's bondholders and other existing creditors.

In the wake of the *RJR Nabisco* case, the legal relationship between a solvent corporation and its creditors seems reasonably clear. Manage-

ment will manage the corporation's affairs for the benefit of the stockholders, to whom they and the corporation owe fiduciary duties. No such duties are owed to creditors. A corporation must honor its express contractual commitments to creditors, and it must also refrain from fraud or other conduct violating other statutory or common law rules that afford creditors some narrow further protection. An additional penumbra of protection may be created around express contractual commitments through use of the implied covenant of good faith and fair dealing. However, the implied covenant will not be extended to protect creditors from corporate action harmful to their interests where the action in question is not covered by express contractual commitments, or is expressly permitted by them.

If creditors are dissatisfied with the status quo, the courts have indicated, the solution is for them to protect themselves by negotiating appropriate contractual commitments and by refusing to purchase debt securities or otherwise extend credit to the corporation if such commitments cannot be negotiated. One can sympathize with the courts. The range of possible contractual provisions that might be negotiated is immensely broad, and in the negotiating process many trade-offs normally occur. Required to step in years after the debt securities were issued and at a time when conditions may be completely changed, and to attempt to define what is "fair" or what the parties would have agreed to if they had thought to address some issue, a court can only engage in guesswork and the exercise of hindsight. The task is sufficiently daunting to make even a judicial activist reluctant to take it on.

To what extent creditors will be successful in obtaining more stringent contractual commitments to protect their interests remains to be seen. There are problems. The buyers of debt securities are numerous and diverse. The buyers may not agree on what covenants an indenture should contain, or what trade-offs should be made between protective covenants and maturity, interest rate, and other substantive terms. Buyers usually come on the scene relatively late in the process, when the covenants have been fixed, at least tentatively, by negotiations between the issuer and underwriters. The underwriters, of course, have an interest in seeing that bondholders' rights are protected, at least to the extent that investors will be willing to purchase the bonds. However, the underwriters also must persuade the issuer to retain them, and thus are understandably reluctant to press the issuer too far. Issuers are reluctant to agree to stringent covenants, particularly with respect to widely held, long-term debt securities, where it may be difficult to impossible to obtain a modification or waiver of the covenants required by a subsequent change in circumstances.

The indenture trustee, it has been suggested,[13] might be given an expanded role in negotiating adequate protective covenants. Indenture trustees, however, like bond counsel, historically have viewed their role as ensuring that the mechanical provisions of the indenture work properly and that the indenture complies with applicable legal requirements. They are unlikely to want to expand their role to encompass the negotiation of covenants, a role that might later subject them to criticism and liability if the covenants they negotiated prove inadequate. The possibility remains that institutional investors, rating agencies, indenture trustees, and underwriters may reach consensus as to certain covenants that should be regarded as "minimum" or "standard" and included in at least most indentures. Whether any such covenants could be imposed on issuers generally would depend on the extent to which institutional investors are willing to refuse to participate in issues that do not contain them. Thus far, little evidence has been found that institutional investors will do so. The recent decline in market value of outstanding debt securities not adequately protected by covenants may, however, be sufficient to bring about a change.

Fiduciary Duties of the Insolvent Corporation

The insolvent corporation and its management owe fiduciary duties to creditors, as well as to stockholders. This shift in responsibility takes place upon insolvency, even in the absence of a bankruptcy case or other formal proceeding.[14] Relatively few cases are to be found involving insolvent corporations outside of bankruptcy, however, and most attention has been devoted to the fiduciary responsibilities of a bankrupt corporation and its management.

A corporation that is a debtor in possession in a case under Chapter 11 of the Bankruptcy Code has, with few exceptions, all of the rights, functions and duties that a trustee would have, had a trustee been appointed in the case.[15] Like a trustee, the corporate debtor in posses-

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[13] Robertson, 1988. "Debentureholders and the Indenture Trustee: Controlling Managerial Discretion in the Solvent Enterprise." *Harvard Journal of Law and Public Policy*, vol. 11, p. 461.

[14] See *New York Credit Men's Adjustment Bureau v. Weiss*, 305 N.Y. 1, 110 N.E.2d. 397 (N.Y. 1953); *Clarkson Co. Ltd. v. Shaheen*, 660 F.2d 506 (2d Cir. 1981), *cert. denied*, 445 U.S. 990 (1982); Norton, 1975. "Relationship of Shareholders to Corporate Creditors Upon Dissolution: Nature and Implications of the 'Trust Fund' Doctrine of Corporate Assets." *Business Law*, vol. 30, p. 1061.

[15] U.S.C. 1107(a). A "debtor in possession" simply means a debtor that continues to operate and manage its business in a Chapter 11 case in which no trustee has been appointed. 11 U.S.C. 1101(1).

sion and its management must act with due regard for the interests of both stockholders and creditors. This dual responsibility often gives rise to problems. The law relative to the responsibilities of fiduciaries to differing classes of beneficiaries originated, and has been most fully developed, in the context of trust law, not corporate law. While the trustees administering a trust may owe duties to classes of beneficiaries having different interests, and may have difficulty in reconciling those interests, the conflict normally arises in relatively common situations, where precedent exists to guide the trustee in making the decision. For instance, the trustee may not invest the trust assets entirely or disproportionately in non-income-producing assets, since that would penalize income beneficiaries and unfairly benefit remaindermen. Nor may the trustee invest in wasting assets, or refuse to make expenditures to maintain trust property, where that would unfairly benefit the income beneficiaries to the detriment of the remaindermen.

In a corporate context, the situations are more diverse and less standardized. A Chapter 11 trustee, or the management of the debtor in possession, must make decisions both in operating the business and in negotiating a plan of reorganization. These decisions will affect stockholders and various classes of creditors. The law indicates that the decisions must be made with due regard for the interests of all concerned. Little guidance can be found, however, as to how the conflicting interests should be reconciled or as to how a decision as to what is fair should be reached.[16]

Management has been accustomed, prior to insolvency, to representing the interests of stockholders. In many cases management will also hold a substantial interest in the corporation's stock. Also, the filing of a Chapter 11 case does not change the manner in which a corporation's directors are selected; they continue to be elected by stockholders. It is thus not surprising that management may continue to be concerned primarily with stockholder interests, despite the shift in its legal duties. If it becomes apparent that management is not properly exercising its responsibilities to creditors, the creditors may seek the appointment of a trustee.[17] In rare cases, they may persuade the court to interfere directly with management of the debtor in possession.[18]

It is not necessarily creditors who will be dissatisfied with manage-

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[16] The most comprehensive discussion is in Case, 1988. "Fiduciary Duty of Corporate Directors and Officers, Resolution of Conflicts Between Creditors and Shareholders, and Removal of Directors by Dissident Shareholders in Chapter 11 Cases." Williamsburg Conference on Bankruptcy, page 373 (ALI-ABA 1988).

[17] 11 U.S.C. 1104(a).

[18] *In re Gaslight Club, Inc.*, 782 F.2d 767 (7th Cir. 1986); *In re United Press International, Inc.*, 60 B.R. 265 (Distr. Col. 1986); *In re FSC Corp.*, 38 B.R. 346 (W.D. Pa. 1983).

ment. In a minority of cases, the debtor's board of directors and officers may be taking their new fiduciary responsibilities to creditors quite seriously, to the dismay of stockholders. The stockholders may conclude that management has sold out to the enemy, and attempt to elect new directors who will be more responsive to their interests. The stockholders will generally be allowed to do so.[19] However, where the attempt to shift management occurs late in the reorganization process and would seriously jeopardize confirmation of a plan or reorganization, the bankruptcy court may restrain the stockholders from changing the board of directors in accordance with normal state law procedures.[20]

Treatment of Creditors and Stockholders in a Plan of Reorganization

The focal point of a Chapter 11 case is the negotiation and formulation of a plan of reorganization. If no trustee has been appointed, only the debtor may file a plan during the first 120 days of the case. Thereafter, any party in interest may file a plan. The court may, for cause, extend or reduce the 120-day period. If a trustee has been appointed in the case, any party in interest may file a plan at any time, but the custom is to allow the trustee a reasonable opportunity to formulate and file a plan first.[21]

Negotiation of the plan's substantive terms involves the debtor's management, the trustee if one has been appointed, a committee appointed to represent unsecured creditors, additional committees that may be appointed to represent particular groups of creditors or stockholders, any indenture trustees, and major individual creditors, particularly secured creditors. The parties are free to negotiate the substantive economic terms of the plan, depending on the debtors' financial condition and prospects and the parties' relative bargaining power. However, in formulating the plan they must keep in mind a number of technical legal requirements that must be complied with.

The Bankruptcy Code distinguishes between claims and equity securities or interests.[22] The plan must classify claims and interests, based largely on their nature and status under applicable law, and

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[19] *In re Lionel Corp.*, 30 B.R. 327 (S.D.N.Y. 1983); *In re Saxon Industries, Inc.*, 39 B.R. 49 (S.D.N.Y. 1984).

[20] *In re Johns-Manville Corp.*, 52 B.R. 879 (S.D.N.Y. 1985), aff'd., 60 B.R. 842 (Distr. Ct. S.D.N.Y. 1986), reversed and remanded, 801 F.2d 60 (2d Cir. 1986), op. on remand, 66 B.R. 517 (S.D.N.Y. 1986).

[21] 11 U.S.C. 1121.

[22] 11 U.S.C. 101(4) ("claim"); 101(11) ("debt"); and 101(15) ("equity security").

specify the treatment to be afforded to each class.[23] Claims or interests may not be included in a single class unless they are substantially similar in nature.[24] Thus, secured claims must be classified separately from unsecured claims; and secured claims secured by different collateral, or by liens having different priorities in the same collateral, may not be included in the same class.[25] Some unsecured claims, such as certain claims for wages, for employee benefits, for consumer deposits, or for taxes, are entitled to priority in payment over other unsecured claims.[26] These will usually also require separate classification, and the plan's treatment of them may be specified by law and subject to negotiation only to a limited extent.[27] Unsecured claims may not be classified with secured claims, or with priority claims. Some difference of opinion exists as to whether all unsecured claims must ordinarily be included in a single class, or may be broken into two or more classes that are treated differently under the plan. However, provision is made for a separate class of small claims, known as administrative convenience claims, that are normally paid in cash.[28] The Bankruptcy Code recognizes the validity of contractual subordination agreements, and such agreements will be given effect in a Chapter 11 case.[29] Subordinated debt should be classified separately from non-subordinated debt, and the treatment given to it in the plan should reflect the effect of the subordination. Finally, preferred stock issues and common stock will be dealt with as separate classes of equity securities.

A proper classification of claims and interests is important. The class in which a claim or interest is placed determines what the holder will receive under the plan. Acceptance or rejection of the plan is by vote of each impaired class.[30] Well-planned classification can maximize the likelihood of acceptance by creditors and stockholders. Improper classification may make the plan unconfirmable, or may preclude resort to use of the cramdown provisions.

Once the plan has been negotiated and drafted, it is filed with the court, together with a disclosure statement which must be approved by the court as containing sufficient information to allow creditors and stockholders to make an informed decision as to whether to accept or reject the plan. The plan and disclosure statement are then submitted to

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[23] 11 U.S.C. 1123(a)(1) and (3).

[24] 11 U.S.C. 1122(a).

[25] *Brady v. Andrew (In re Commercial Western Finance Corp.)*, 761 F.2d 1329 (9th Cir. 1985).

[26] 11 U.S.C. 507(a).

[27] 11 U.S.C. 1129(a)(9).

[28] 11 U.S.C. 1122(b).

[29] 11 U.S.C. 510(a).

[30] As to what constitutes impairment, see 11 U.S.C. 1124.

the holders of each impaired class of claims or interests, together with a written ballot providing for the acceptance or rejection of the plan. Acceptance of the plan by a class of claims requires the vote of the holders of at least two-thirds in amount and more than one-half in number of the claims in that class which have voted. Acceptance of the plan by an impaired class of equity securities requires the vote of holders of at least two-thirds of the securities in the class which have voted.[31]

The plan of reorganization is not legally effective until it is confirmed by the court. Confirmation involves a determination that a number of requirements have been satisfied. In the absence of active opposition to confirmation, the court's inquiry into many of the requirements will be brief. The requirements will vary depending on whether or not the plan has been accepted by each impaired class of claims or interests.[32]

If the plan has been so accepted, the principal remaining requirements include a determination that the holders of claims or interests in each impaired class will receive or retain under the plan property of a value that is not less than they would receive if the debtor were liquidated in a Chapter 7 case.[33] This determination requires presentation to the court of a liquidation analysis and evidence as to the liquidation value of the debtor's assets. The analysis is relatively uncomplicated and straightforward. No going concern valuation is required. The court must also determine that confirmation of the plan is not likely to be followed by liquidation or the need for further reorganization, except to the extent contemplated by the plan.[34]

The bankruptcy court may confirm a plan even though it has not been accepted by each impaired class of claims or interests, if the plan does not discriminate unfairly, and is fair and equitable to each nonaccepting impaired class.[35] "Fair and equitable" is a term of art, embodying a rule, known as the absolute priority rule, that claims and interests be ranked in order of their legal priority and satisfied in that order.[36] Junior claims or interests may not participate under the plan unless the plan provides for full satisfaction of senior claims or interests. Full satisfaction need not be in cash or cash equivalents. The "order" of

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[31] 11 U.S.C. 1126(c) and (d).

[32] If any class of claims is impaired, the plan must have been accepted by at least one class of impaired claims. 11 U.S.C. 1129(a)(10).

[33] 11 U.S.C. 1129(a)(7).

[34] 11 U.S.C. 1129(a)(11).

[35] 11 U.S.C. 1129(b)(1).

[36] The absolute priority rule, and the basis for it, are discussed in Baird and Jackson, 1988. "Bargaining After the Fall and the Contours of the Absolute Priority Rule," *University of Chicago Law Review*, vol. 55, p. 738.

priority is not temporal; the period over which senior claims are to be paid may extend beyond the period for paying junior claims, so long as the senior creditors receive interest and the payments to them are reasonably assured.[37]

The Bankruptcy Code specifies what types of treatment will be "fair and equitable" as to specific types of claims or interests. These provisions, known as the cramdown provisions, are complex and need not be discussed in detail. However, two general points should be made.

First, the plan will usually provide for the issuance of securities in satisfaction of all or part of some claims or interests. Determining whether such a plan is fair and equitable requires a valuation of the securities and other consideration to be distributed under the plan. This, in turn, will require a valuation of the debtor's business. This valuation is a going concern valuation, based on projected revenues, cash flow and earnings, and not simply a liquidation valuation.[38] Such a valuation is time-consuming, expensive, and highly uncertain. As a result, all parties have a considerable incentive to negotiate a plan that will be acceptable to all impaired classes, thus enabling the plan to be confirmed without resort to the cramdown provisions and without regard to the absolute priority rule.

Second, both the rules relating to the classification of claims and the cramdown provisions assume that claims and interests can be broken down into categories on the basis of a few common characteristics, and that it will usually be possible to place particular claims or interests into a particular category without litigation and with a high degree of certainty. A given claim will be put into a particular class depending on whether it is secured or unsecured, whether or not it is entitled to priority under some provision of the Bankruptcy Code, or whether it is subordinated debt or senior debt. Other characteristics, such as the maturity of the claim, or the contractual interest rate to which the claim is entitled, will usually not be relevant. Two issues of unsecured debentures, one of which bears interest at 11 percent and matures in five years, and the other bears interest at 9 percent and matures in ten years, may be grouped together in a single class, and be treated similarly under the cramdown provisions.

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[37] *Prudential Ins. Co. v. Monnier (In re Monnier Bros.)*, 755 F.2d 1336, 1342 (8th Cir. 1985).

[38] See Fearon and Julis, 1983. "The Role of Modern Finance in Bankruptcy Reorganizations." *Temple Law Quarterly*, vol. 56, p. 1. For a particularly thorough judicial valuation, see *In re Jartran, Inc.*, 44 B.R. 331 (N.D. Ill. 1984).

Leveraged Buyouts and New Types of Debt Instruments in Bankruptcy Cases

The increasing volume of debt associated with leveraged buyouts, and the more exotic forms of debt instruments used, create considerable uncertainty as to how claims and interests will be treated in a Chapter 11 case. For bankruptcy purposes, a leveraged buyout is not one that is characterized simply by the amount of debt involved. It is a purchase of a business in which the credit of the acquired business itself, rather than that of the buyer, is used to finance a significant portion of the purchase price.

A leveraged buyout may be attacked on a number of bases or legal theories. For instance, state corporate statutes restrict a corporation's repurchase or redemption of its own stock, if the corporation's capital would be impaired thereby or the corporation rendered insolvent.[39] In a well-planned leveraged buyout, appraisals and valuations will be obtained to ensure that these rules are not violated. However, value is a question of fact and, if the leveraged buyout fails, the appraisals and valuations may be subject to challenge with hindsight. Case law also exists holding that, where a corporation repurchases or redeems its own stock and issues a note for the price, the note will be subordinated to other claims against the corporation if it later becomes insolvent or is involved in a bankruptcy case. This may be true even though the corporation was not insolvent and had adequate capital at the time the repurchase or redemption took place, and the transaction fully complied with state corporate law.[40]

Fraudulent conveyance law may also enable a trustee or debtor in possession to attack a leveraged buyout. This issue may arise either under Section 548 of the Bankruptcy Code or under applicable state law.[41] The trustee or debtor in possession may avoid any transfer of property made, or obligation incurred, by a debtor with actual intent to hinder, delay, or defraud present or future creditors. This is not usually a problem in transactions involving publicly held corporations. However, the trustee or debtor in possession may also avoid, without regard to actual fraudulent intent, a pre-bankruptcy transfer or obligation for

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[39] For example, Delaware Corporation Law 160(a); Revised Model Business Corporation Act 6.40.

[40] *Liebowitz v. Columbia Packing Co.*, 56 B.R. 222 (Distr. Ct. D. Mass. 1985). See also 11 U.S.C. 510(b).

[41] The substantive provisions of state fraudulent conveyance law will usually not differ materially from those of section 548. However, section 548 applies only where the transfer or obligation sought to be avoided occurred within one year of the bankruptcy filing. The statute of limitations under state law is usually considerably longer.

which the debtor did not receive a reasonably equivalent value, if the debtor was insolvent at the time of the transaction or was rendered insolvent by the transaction, or if the debtor was engaged in a business for which the remaining property was unreasonably small capital. Even where the buyer pays a fair price for the business, a question remains whether reasonably equivalent value has been given, since the money ended up in the hands of the corporation's stockholders. Whether the price was fair, and whether the debtor was left with an unreasonably small capital, are, again, questions of fact. The risk of an attack based on fraudulent conveyance law is perhaps the most dangerous, because it cannot easily be eliminated or minimized by restructuring the form of the transaction.

Lawyers and judges are aware that the transactions to which fraudulent conveyance statutes were intended to apply bear little resemblance to most leveraged buyouts. A strong argument can be made that a leveraged buyout is a legitimate business transaction, usually done openly with disclosure to all parties, and without any actual intent to defraud or attempt by creditors to take advantage of a financially pressed debtor. Scholarly arguments have been made that fraudulent conveyance law should not be used to defeat such legitimate business transactions.[42] Some cases have accepted this argument. Nonetheless, leveraged buyouts have now been successfully attacked in a number of cases.[43] The current state of the law can fairly be characterized as confusing and unsettled. Disclosure documents and legal opinions used in connection with leveraged buyouts give the banks, bondholders, and other parties extending credit fair warning that the obligations that they are acquiring may or may not stand up in the event of a fraudulent conveyance attack in a bankruptcy case.[44]

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[42] Baird and Jackson, 1985. "Fraudulent Conveyance Law and Its Proper Domain." *Vanderbilt Law Review*. vol. 38, p. 829. See also, Carlson, 1985. "Leveraged Buyouts in Bankruptcy." *Georgia Law Review*, vol. 20, p. 73.

[43] *United States v. Gleneagles Investment Co., Inc.*, 565 F.Supp. 556 (M.D. Pa. 1983), *affirmed in part; United States of America v. Tabor Realty Corp.*, 803 F.2d 1288 (3d Cir. 1986), *cert. denied; McClellan Realty Corp. v. United States*, 107 S.Ct. 3229 (1987); *In re Ohio Corrugating Co.*, 70 B.R. 920 (N.D. Ohio 1987); and *Wieboldt Stores, Inc. v. Schottenstein*, 94 B.R. 488 (N.D. Ill. 1988). See also, Sherwin, 1988. "Creditors' Rights Against Participants In A Leveraged Buyout." *Minnesota Law Review*, vol. 72, p. 449 (1988).

[44] For instance, the disclosure documents in one transaction included the following language:

> If in a lawsuit by an unpaid creditor, such as a trustee in bankruptcy, a court were to find that, at the time the Company incurred the indebtedness represented by the Debentures and the Senior Bank Debt, the Company (i) was insolvent, (ii) was rendered insolvent by reason of such incurrence, (iii) was engaged in a business or transaction for which its remaining assets constituted unreasonably small capital or (iv) intended to incur, or believed that it would incur, debts beyond its ability to pay

A risk also exists that debt issued in a leveraged buyout may be subordinated in a bankruptcy case on the grounds that it was actually a capital contribution. This determination may be made when the ratio of debt to equity was unreasonably large, when the debt was incurred to stockholders more or less in proportion to their stock ownership, and where the circumstances indicate that the holders of the debt knew or should have known that no reasonable likelihood existed that the debt could be repaid on the terms agreed to. In some leveraged buyouts, an investor, or an investor and its affiliate, will acquire both equity interests and debt instruments in the transaction. Where the debt instruments are zero-coupon, or provide for the deferral of interest if cash flow will not permit its payment, or for payment of interest in kind with stock or additional debt, a bankruptcy judge may be persuaded that the "debt" looks very much like capital, and should be subordinated to the claims of other creditors.

I do not imply that leveraged buyouts are legally defective, or that the debt arising from them will invariably, or even usually, be successfully attacked in a bankruptcy case. My point is that considerable uncertainty remains. In part this uncertainty may be dispelled as additional cases are decided. Leveraged buyouts became common only ten years or so ago. Most of the failed leveraged buyouts that have thus far been tested in the courts involved relatively small corporations, and the buyouts may not have been structured with as much care as in later transactions involving larger corporations. There is some hope that the law will become clearer over the next few years, as the first wave of failures involving large, well-structured leveraged buyouts gives rise to judicial opinions. However, this is far from certain. Most of the issues involved are very fact-oriented. Even courts applying the same statutory provisions, and interpreting them in much the same manner, may arrive at very different conclusions from case to case depending on the particular circumstances involved. I thus would expect that confusion and uncertainty will persist for some time.

So long as the uncertainty does exist, Chapter 11 cases involving failed leveraged buyouts will be difficult ones. In the absence of general agreement as to how these claims rank relative to other claims, disputes will occur as to proper classification and treatment of claims and interests. In most Chapter 11 cases, negotiations result in a plan of

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as such debts matured, such court may find the Acquisition involved one or more fraudulent conveyances and permit such indebtedness to be avoided. Moreover, the Debentures and the Senior Bank Debt could be subordinated to claims of existing and future creditors of the Company.

reorganization acceptable to all or almost all classes because the law is sufficiently clear to allow creditors and stockholders to have some idea as to how the cramdown provisions would operate, and as to how they might be affected thereby, in the absence of agreement. In other words, the cramdown provisions often need not be utilized precisely because their existence drives the parties towards agreement. In the absence of any certainty as to how the law would ultimately treat claims and interests, reaching an agreement will be a lengthy and difficult task.

It has also been suggested that the parties financing the larger leveraged buyouts are too sophisticated, and have too much at stake, to let these issues be decided by the courts.[45] The investors, it is suggested, will be motivated to act quickly at the first sign of failure, and to negotiate a reasonable settlement without the delay, the expense, and the roll of the dice involved in bankruptcy litigation. This may in fact occur in some cases. But where financing is provided through the issuance of junk bonds that are publicly held, or held by a relatively large number of institutional investors, it remains to be seen whether these investors will be able to resolve their differences in the manner suggested.

Conclusion

At least some significant percentage of the leveraged buyouts that have taken place over the last few years will fail, and the corporations involved will seek reorganization under Chapter 11. In these cases, the debtor in possession's management will be making decisions that will have an important effect on what creditors and stockholders will receive under a plan of reorganization with only vague guidance as to how it should discharge its fiduciary responsibilities. Even competent management, trying to discharge fairly its obligations to conflicting classes of creditors and stockholders, and advised by competent counsel, will find it difficult to determine the rights and relative standing of various classes of creditors and stockholders, and how these should be reflected in any plan of reorganization. In this atmosphere of confusion and uncertainty, the traditional distinctions between classes of debt and equity may blur. Until recently, a general understanding held that secured debt had to be paid before unsecured debt, and that preferred stock more or less had to be satisfied ahead of common stock. Senior classes were expected to

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[45] Jensen, Michael C. 1989. "Eclipse of the Public Corporation." *Harvard Business Review*, September-October p. 61, pp. 72–73.

make some concessions in favor of junior classes during the negotiation of the plan of reorganization, but the legal rules set relatively narrow boundaries for the extent of concessions that could be obtained. Over the next few years, the situation may be a good deal more fluid. Parties may be unable to reach concessions as to a plan, and resort to cramdown provisions and a judicial determination of rights may be more frequent.

Discussion

*Richard T. Peters**

Charles Normandin is to be complimented for his excellent effort identifying and forecasting legal trends in an area in which statutory and decisional law has lagged by several years behind the state-of-the-art developments in the financial and business community. It does indeed appear likely that the massive amount of debt represented by conventional debt instruments and hybrid securities arising from the wave of leveraged buyouts will constitute the principal area of future legal activity dealing with the changes in the traditional nature of debt and equity. Further, it is in the context of bankruptcy, corporate reorganization, and out-of-court workouts that such changes will have their greatest impact upon the rights of secured lenders, trade creditors, bondholders, and stockholders.

To date, the courts have only begun to delve into the intricacies of the rights, priorities, and entitlements of the holders of acquisition debt of a failed leveraged buyout. Currently, the primary focus of litigants, and correspondingly the courts, consists of attempts to apply fraudulent conveyance law (either under section 548 of the Bankruptcy Code or parallel provisions of state law) to the participants in the leveraged buyout,[1] or to seek to equitably subordinate the acquisition debt to the

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[1] See, for example, *Kupetz v. Wolf*, 845 F. 2d 842 (9th Cir. 1988); *Wieboldt Stores v. Schottenstein*, 94 Bankr. 488 (N.D. Ill. 1988); *Mellon Bank v. Metro Communications, Inc.* (*In re Metro Communications, Inc.*), 95 Bankr. 921 (Bankr. W.D. Pa. 1989); *Ohio Corrugating Co. v. DPAC, Inc.* (*In re Ohio Corrugating Co.*), 91 Bankr. 430 (Bankr. N.D. Ohio 1988); *Anderson Industries, Inc. v. Anderson* (*In re Anderson Industries, Inc.*), 55 Bankr. 922 (Bankr. W.D. Mich. 1985).

claims of other creditors of the acquired or merged company.[2] Especially probative is Normandin's observation that a Bankruptcy Court may well be inclined to treat certain acquisition debt of a failed leveraged buyout as a capital contribution rather than true debt where a threefold test is met: that is, when the ratio of debt to equity was unreasonably large; when the debt was incurred (or, presumably, paid outright) to stockholders more or less in proportion to their stock ownership; and where the circumstances indicate that the holders of the debt knew or should have known that there was no reasonable likelihood that the debt could be repaid on the terms agreed to.[3] Under such circumstances, it is suggested that the Court, in a case of reorganization of the failed leveraged buyout, may regard the acquisition debt as a substitute for the previously existing equity capital of the failed enterprise, for purposes of determining distributions under the leveraged buyout's confirmed plan of reorganization.

Accepting the foregoing thesis as valid for analytical purposes, the recharacterization of leveraged buyout acquisition debt as legally inferior to pre-buyout and possibly post-buyout general unsecured debt raises a number of other issues in connection with bankruptcy cases. The Bankruptcy Code, for instance, restricts one basic right to creditors only (that is, eligibility to file an involuntary petition against the debtor),[4] and permits other remedies during a bankruptcy case to be pursued by any "party in interest" (for example, the right to seek the appointment of a trustee or examiner).[5] The term "party in interest" is not defined in the Code, however, and, accordingly, the courts have developed a pragmatic test for determining whether a particular entity is a party in interest with respect to a particular proceeding before the court.[6] One court formulated the test as "whether the prospective party in interest has a sufficient stake in the outcome of a proceeding as to require representation."[7]

As Franklin Allen points out, one of the fundamental attributes of debt has historically been that "debtholders . . . have the right to force

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[2] *In re Matter of The Hawaii Corp.*, 694 F.2d 179 (9th Cir. 1982); *McConnell v. Estate of Butler*, 402 F.2d 362 (9th Cir. 1968); see generally, P. Blumberg, *The Law of Corporate Groups*, Ch. 5 (1985).

[3] Charles P. Normandin, "The Changing Nature of Debt and Equity: A Legal Perspective," this volume.

[4] 11 U.S.C. § 303(b)(1).

[5] 11 U.S.C. § 1104(b)

[6] See, for example, *In re Public Service Co. of New Hampshire*, 88 Bankr. 546 (Bankr. D.N.H. 1988).

[7] *In re Amatex Corp.*, 755 F.2d 1034, 1042 (3d Cir. 1985).

bankruptcy" upon their obligor's default.[8] Whether all holders of leveraged buyout acquisition debt will be entitled to exercise this right in the event of a failed leveraged buyout, however, remains to be determined. Under the Bankruptcy Code, an involuntary petition may be filed only by the holders of "claims" as defined in section 101(4) of the Code or an indenture trustee representing the holders of claims.[9] Stockholders are not afforded the right to commence an involuntary case against the corporation based solely on their equity security interests.[10] If, however, the stated conclusion is correct, that leveraged buyout acquisition debt may be treated as equity for purposes of plan classification and treatment, one is led inexorably to inquire whether an indenture trustee, debentureholder, selling stockholder, or other holder of acquisition debt arising from a failed leveraged buyout will be eligible as a petitioning creditor under section 303(b) of the Code. Moreover, under the 1984 amendments to the Bankruptcy Code, an entity is eligible to serve as a petitioning creditor only if its claim is not "the subject of a bona fide dispute."[11] The disqualifying "bona fide dispute" may be either factual or legal in nature, with at least one court opining that an entity is not eligible to be a petitioning creditor unless it would be entitled to summary judgment on its claim under state or federal law.[12] It should be anticipated, therefore, that a material dispute regarding the proper legal characterization of a petitioner's leveraged buyout acquisition claim as equity rather than debt would serve to disqualify the holder as a petitioning creditor.

Even with respect to remedies arising during the course of a bankruptcy case that can be asserted statutorily by any party in interest, the standing of acquisition debt holders to invoke certain remedies may be questioned by the courts. One such remedy is the right to seek the appointment of an examiner or trustee on one or more of the bases contained in sections 1104(a) and (b) of the Code. Although statutorily the appointment may be sought by any party in interest, some courts have been reluctant to order even the seemingly mandatory appointment of an examiner (where the debtor's fixed unsecured debts exceed

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[8] Franklin Allen, "The Changing Nature of Debt and Equity: A Financial Perspective," this volume.

[9] 11 U.S.C. § 303(b)(1). A "claim" as defined in § 101(4) is contrasted with an "equity security" as defined in § 101(15) of the Code. Equity security interests have been held to not constitute claims for purposes of the Bankruptcy Code definition. *In re Pine Lake Village Apartment Co.*, 8 B.C.D. 1334 (Bankr. S.D.N.Y. 1982).

[10] 2 *Collier on Bankruptcy* ¶ 303.08(7) (15th ed. 1989); 3 Collier on Bankruptcy ¶ 59.08(1) at 580 (14th ed. 1977).

[11] 11 U.S.C. § 303(b)(1).

[12] *In re Stroop*, 51 Bankr. 210, 212 (Bankr. D. Colo. (1985); but see *In re Lough*, C.B.C 2d 375, 379 (Bankr. E.D. Mich. 1986)

$5 million[13]) if it appeared that the movants (typically class action claimants in securities fraud litigation accompanying the reorganization case) held no cognizable economic interest in the reorganization case.[14] Depending on the nature of the leveraged buyout and the capital structure of the resulting enterprise, it would not be surprising for the courts to similarly curtail the rights in bankruptcy of the holders of acquisition debt.

Even greater problems are likely to arise in connection with the formulation of the failed leveraged buyout's Chapter 11 plan. Difficult legal issues will be confronted with respect to the classification and treatment of claims and equity interests, and, as part of the treatment, the distribution of voting power and management rights in the reorganized company.

The changing nature of debt and equity, in the context of the failed leveraged buyout's Chapter 11 case, will be prominently displayed in the area of classification[15] where the various creditor and stockholder constituencies have been unable to reach agreement as to the terms of a consensual plan. Classification often becomes critically important in this context because of the plan proponent's need to obtain "acceptance" of the plan by each class of impaired claims and interests. Failing acceptance of the plan by (i) "at least two-thirds in amount and more than one-half in number" of the allowed claims voting,[16] and (ii) "two-thirds in amount" of allowed interests voting,[17] the plan proponent must resort to the Code's cramdown provisions in order to obtain confirmation of the plan.[18] At risk, if the acceptance of each impaired class is not obtained, is the possibility that no class of claims or interests junior (for example, stockholders) to the dissenting class (for example, subordinated, unsecured debt) will be entitled to receive a dividend under the plan or retain an interest in the reorganized company.[19]

As a result of the statutory scheme, the plan proponent will attempt to structure the plan by classifying claims in a manner most likely to

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[13] 11 U.S.C. § 1104(b)(2).

[14] See, for example, *In re De Laurentiis Entertainment Group Inc.*, Case No. LA 88-17251-AA (Bankr. C.D. Cal.) ((Order, After Hearing, Denying Motion for Appointment of Examiner, entered Jan. 17, 1989); *In re Castle Entertainment, Inc.*, Case No. LA 83-12251-CA (Bankr. C.D. Cal.) (Findings of Fact and Conclusions of Law re "Motion for Appointment of an Examiner," entered Feb. 23, 1984).

[15] The concept of classification is governed by the seemingly innocuous provisions of 11 U.S.C. § 1122(a):

> [A] plan may place a claim or an interest in a particular class only if such claim or interest is substantially similar to the other claims or interests of such class.

[16] 11 U.S.C. § 1126(c).

[17] 11 U.S.C. § 1126(d).

[18] 11 U.S.C. § 1129(a)(8) and 1129(b)(1).

[19] 11 U.S.C. § 1129(b)(2)(B)(ii).

result in the acceptance of each impaired class by the requisite percentages. For example, in order to offset the anticipated rejection of the plan by a dissident creditor holding a large unsecured claim, the plan proponent may attempt to classify the claims of the company's subordinated bondholders (who are expected, in this instance, to vote in favor of the plan) in the same class. Although not entirely free from doubt, it appears that such classification is currently permissible.[20] (The subordinated debt will share pari passu with unsecured creditors vis-à-vis the debtor, but will be deemed to have assigned any consideration received under the plan to the holders of senior indebtedness as defined in the governing indenture.) It is problematic, however, whether the foregoing classification will be upheld under Normandin's thesis if the subordinated debt in the example consists of leveraged buyout acquisition debt. At a minimum, the essential character of the acquisition debt as a replacement of the previously existing equity in the company gives rise to an additional ground of objection to the described classification in favor of the dissenting creditor. Failure to reach agreement as to the terms of a consensual plan can also be expected to give rise to classification disputes between holders of the acquisition debt and general unsecured creditors; holders of the acquisition debt and any pre-existing subordinated debt; and the holders of subordinated acquisition debt and the new stockholders.

Also unresolved is the question of how management and voting power will be allocated among the various constituencies upon the reorganization of the failed leveraged buyout. Current provisions of the Bankruptcy Code unfortunately lend little guidance in this area. The Code specifies that the plan must prohibit the issuance of nonvoting equity securities; provide for an "appropriate distribution" of voting power among the classes of securities possessing voting power; adequately provide that any class of equity securities having dividend preference over another class of equity securities be entitled to elect directors representing the preferred class upon default in the payment of dividends;[21] and that the retention post-confirmation of the debtor's officers and directors must be "consistent with the interests of creditors and equity security holders and with public policy."[22]

The current Code provisions are mandatory and are modeled on the corresponding provisions of Chapter X of the former Bankruptcy Act.[23] While scant authority exists under the new Code as to what will

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[20] 5 *Collier on Bankruptcy* ¶ 1122.03(7) at 1122-17 (15th ed. 1989).
[21] 11 U.S.C. § 1123(a)(6) and (7).
[22] 11 U.S.C. § 1129(a)(5)(A)(ii).
[23] 5 *Collier on Bankruptcy* ¶ 1123.01(6) (15th ed. 1989).

constitute an "appropriate distribution" of voting power, certain cases decided under Chapter X of the old Act and the commentary thereunder are enlightening.[24] At the heart of the provision is the notion that creditors who relinquish their contractual rights to receive payment in a fixed amount, at a stated maturity, return, and priority in exchange for stock in the reorganized enterprise, assume the risk that the reorganized company will be successful; by so doing, the former creditors are entitled to the assurance that the company is being managed in their best interest.

Allocating voting power, control, and management rights upon the reorganization of a failed leveraged buyout may prove difficult. Subordinated acquisition debt may not be able to negotiate participation in the company's cash or senior indebtedness upon reorganization, and may correspondingly demand a large percentage of the reorganized company's common stock and attendant voting rights. The courts may once again be called upon to determine the true character of the obligation incurred by the company and whether the subordinated bondholders have already assumed the risk of the company's success as the basis for recovery of their investment.

The foregoing are but a few of the issues that are likely to arise in the corporate reorganization context, as the traditional distinctions between debt and equity become obscured in the future. I agree with Normandin's observation that case precedent is essential in the areas of classification, treatment, and cramdown so as to enable the parties financially interested in a failed leveraged buyout to resolve their differences through the process of negotiation rather than litigation.

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[24] See, for example, *In re Tharp Ice Cream Co.*, 25 F.Supp. 417 (E.D. Pa. 1938); *In re Chain Investment Co.*, 102 F.2d 323 (7th Cir. 1939); *Highland Towers v. Bondholders Protective Committee*, 115 F.2d 58 (6th Cir. 1940); see also 6A *Collier on Bankruptcy* ¶ 10.21 (14th ed. 1977); Krotinger, 1941, "Management and Allocation of Voting Power in Corporate Reorganizations," *Columbia Law Review*, vol. 41, pp. 646, 672-82.

Discussion

*Robert E. Scott**

Charles Normandin's paper is a perfectly straightforward example of conventional legal wisdom concerning the eroding distinctions between debt and equity. His story has three parts.

(1) The law regulates debt and equity differently because firms owe different duties to shareholders than they do to creditors. The shareholder relationship is fiduciary; the creditor's is an arm's length transaction.

(2) In recent years, the blurring of the distinctions between debt and equity caused by increases in leveraging has led those creditors holding risky debt to seek protection from the managers of solvent firms in the form of fiduciary duties, regulations of good faith and the like. Here they have been largely unsuccessful, the courts generally holding that newly subordinated debt could have protected itself through explicit contracts. Normandin has his doubts about the wisdom of these holdings since creditors may not be able to obtain such contractual protection from firms.

(3) Once the firm goes insolvent, however, it owes fiduciary duties to all claimants (creditors and stockholders). Here the "problem" is that financial innovation makes classifying debt and equity for bankruptcy reorganization purposes very difficult and uncertain, thereby leading to increased costs in negotiating

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> reorganization plans. Here Normandin asserts the value of greater clarity, but does not hold out much hope.

This story, I would like to suggest, contains at least two unstated assumptions. I would like to challenge each one.

The first assumption is generic: that the law is essentially a constraint within which one maneuvers as best he can. In this exercise, it is best to be armed with a trained guide who can point out the baffling mysteries of incomprehensible regulations along the way. To the contrary, I would assert, the law of corporations, secured financing, and bankruptcy (what I will call "commercial law") is not a constraint but a variable: the relevant legal regulations should not just be taken at rhetorical face value. Rather, commercial law is functional: its underlying purposes are to facilitate value-maximizing transactions. The problems come when the functional unity, the logic of the commercial law, is forgotten and the traditional categories or forms of regulation are seen as ends in and of themselves. In this situation, one we face now, the law may seem slow to adapt its regulatory framework to innovation precisely because the underlying conception has itself been lost.

As a derivative of the first premise there is a second assumption. Since the law is a given, no particular value lies in trying to develop a unified conception of the legal regulations. Among five blindfolded men describing an elephant, each visualizes a completely different animal. Similarly, in law, one sees a different scheme of regulations depending on which legal problem one focuses on. This approach thus accepts as a given the traditional legal conception of debt and equity as a contrast between two incommensurables: a) a firm owes legally *imposed* fiduciary duties to shareholders; b) a firm enters into *voluntary* contractual relationships with its creditors. (To be sure, one might try to maneuver but the categorizations are fixed.)

I want to offer a different story, one that challenges both of these assumptions. In the process, I suggest that the problem Normandin identifies—the subordination of existing debt caused by increased leveraging (thus forcing creditors to bear risks normally associated with equity)—is only half of the legal puzzle (and not, to my mind, the more interesting half).

In addition to the problem of treating debt like equity on the downside, a parallel phenomenon is to be found on the upside. Creditors, especially in secured credit relationships, are able to capture some of the upside benefits of equity. This, in turn, raises questions concerning the normative justification for legally protected security interests and lender control liability.

A Contractual Approach

I suggest that the firm's relationship to all its claimants—shareholders and creditors— is fundamentally contractual. To be sure, this is not a startling insight to economists or organizational theorists, all of whom are used to thinking about a firm as a set of contractual relationships. But I want to make a stronger claim. Not only is a contractual theory of the firm valid as a matter of pure theory, but it is the most useful way of understanding the relevant *legal rules* themselves.

To understand the legal regulation of debt and equity in contractual terms, it is useful to think of two different contractual paradigms—discrete or complete contingent contracts on the one hand and relational contracts on the other. A discrete or complete contingent contract is one where the parties are presumed capable of specifying all the relevant terms that govern their relationship at the time of contracting. In this environment, the function of legal rules is to provide a menu of off-the-rack contract terms (or default rules) that will apply unless the parties explicitly opt out and customize an alternative arrangement.

A relational contract, on the other hand, is one where conditions of uncertainty and complexity prevent the parties from accurately specifying all relevant terms of their relationship at the time of contracting. In this case, silence is ambiguous. Parties face more difficult contracting problems. If they agree to specific obligations, subsequent events will outstrip their contract and the agreement will require further adjustment. Furthermore, this adjustment must be carried out in a noncompetitive environment in which each faces the threat of strategic maneuvering by the other. One response, therefore, is to define the contractual obligation in general terms. These terms are called different things in the law—best efforts contracts, fiduciary obligations, and the like—but in each case they are functionally no different from the more precise terms in discrete contracts. They represent a general commitment that each party will act in the future so as to maximize the joint value of their contractual enterprise.

A Contractual Analysis of the Legal Regulation of Debt and Equity

With this reconceptualization, the different legal treatments of debt and equity can be clarified.

(1) The law has historically assumed that debt contracts are discrete (complete contingent contracts). This is because the principal subject matter of the exchange was credit at a fixed price. Under this conception, if the creditors' asset cushion is eroded by subsequent risky debt,

the creditors are presumed capable of purchasing contractual protections in the form of negative pledge clauses and the like. In the absence of such protective agreements, the assumption is that creditors have assumed the risk of subordination for a price.

(2) On the other hand, the relationship between equityholders and the firm is seen as a relational contract. This is because equity claims are more complex and involve ongoing relationships. In this environment, the firm (through its margins) and the shareholders could not feasibly anticipate all future circumstances and assign risks explicitly at the time of contract. Rather, the legal default rule is a general fiduciary obligation that characterizes all principal-agent relationships. Managers must act so as to maximize the joint interests of the parties. Furthermore, given the difficulty in monitoring such contracts, the principal owes a higher duty of good faith and fair dealing as a precommitment against cheating on the contract.

So what has happened? As debt contracts become more like equity, it becomes clear that they are primarily relational. Creditors are providing a range of equity-like contributions to the firm—contributions that cannot be priced out accurately in the initial debt instrument.

Predictably, legal disputes have centered on whether the "relational" obligations of good faith and best efforts should be applied to debt contracts. The issue, then, is not whether shareholders are owed fiduciary obligations and creditors contractual ones. The issue in these leveraging disputes is which legal default rule best suits the needs of most debtors and creditors.

As debt contracts become relational, the costs of contracting and of controlling conflicts of interest rise and the parties require more creative terms. It is not a question of what contract terms issuers *will be willing* to accept. Issuers will accept whatever the market demands. Rather, the doubt as to whether issuers will agree to specific contractual protections for existing debt is caused by uncertainty over what default rules most parties would prefer. In a relational setup, the trade-offs are more severe: (a) Specific contractual restrictions will reduce monitoring costs, but they are error-prone and may not fit particular creditors' needs. (b) Alternatively, general obligations of good faith and best efforts are flexible and promote mutual adjustment, but are difficult to police.

The only way the law has historically been able to make the choice between rules of thumb and general standards is through the quasi Darwinian process of trial and error and innovation—a process that is going on right now. In short, the problem of existing debt being subordinated as leveraging increases is essentially a transition problem. It is not very interesting in the long run except in its contractual dimensions (which are interesting to people like me who study optimal default rules in contractual settings).

(3) What about the function of insolvency? Normandin points out that upon insolvency the firm's managers owe a fiduciary duty to all parties, including creditors as well as equityholders. Once again, however, the focus on fiduciary responsibilities is essentially a red herring.

The key issue upon insolvency is that *individual* contracting behavior can no longer lead inevitably to value-maximizing results. Even if each individual claimant has negotiated an optimal contractual arrangement with the insolvent firm, the various claimants as a group face a classic collective action problem. Individual maximizing behavior is now inconsistent with the interests of the various claimants taken as a whole.

Yet, viewed ex ante, each of the claimants would be willing to agree to forgo his individual rights in order to join a collective proceeding, so long as it maximized the joint interests of all. This is merely an application of a simple prisoner's dilemma game in which parties unable to bargain because of their large numbers will systematically pursue destructive self-interest even though they would collectively benefit from agreements to cooperate. Hence, upon insolvency the law of bankruptcy imposes a collective solution in order to implement this "ex ante creditors' bargain."

Here the problem for the law is how to collectivize so as to maximize joint welfare without permitting individual advantage-taking or rent-seeking behavior by individual claimants seeking to improve their pre-bankruptcy position. Many problems arise once the firm is insolvent, not the least of which is that bankruptcy proceedings take time. They do not begin instantly nor are they resolved instantly, so opportunities for maneuvering are inevitable. But the overriding challenge for the law is to select the right decisionmaker in the collective proceeding.

Management no longer represents all interests adequately. A solvent firm's profit-maximizing behavior benefits both equityholders and creditors. But once the firm is insolvent, the problem is who should decide whether to liquidate or reorganize, and on what terms. Secured creditors have too much to lose and too little to gain from delay, thus they err toward prompt liquidation. Equity has too much to gain and too little to lose from delay since cash-outs destroy probability distributions. They err toward reorganization. Unsecured or general creditors are often the best proxies for the joint interests of all parties: they have something to gain and to lose from the choice between liquidation and reorganization. Indeed, the trustee explicitly represents this constituency.

This framework can then be applied to the current problem of leveraged buyouts and fraudulent conveyance law. If leveraged buyouts were always good things (that is, value-maximizing) or bad things (redistributional), it would be an easy problem for the law. But the problem is that the leveraged buyout device invites occasional redistribution (from creditors to shareholders) under the guise of a legitimate

value-maximizing transaction. Thus, two distinct questions are found in the regulation of leveraged buyouts.

(1) The first is the subordination of existing creditors through increased leverage. This is a question of choosing the optimal default rule. If fraudulent conveyance law applies, the firm has to get the agreement from all creditors in order to opt out of the prohibition against leveraged buyouts. If fraudulent conveyance law is held inapplicable, individual creditors can police against increased risk by purchasing debt restrictions.

As an empirical guess, it seems easier to opt into debt restrictions than to opt out of fraudulent conveyance law. Thus, as to this issue fraudulent conveyance law should not apply to leveraged buyouts.

(2) The problem, however, is that leveraged buyout transactions are vulnerable to managers engineering redistribution among claimants (with the managers then sharing the windfall gains). Here the law might well require mandatory policing mechanisms in order to avoid subsidizing fraud or other non-value-maximizing activities.

One solution to this apparent conundrum is to apply fraudulent conveyance law more selectively. This can be accomplished by focusing on the second prong of the test of constructive fraud.

To qualify as a fraudulent conveyance, the transfer must a) be without fair consideration and b) render the firm insolvent or without sufficient capital. Courts have tended to adopt an all-or-nothing approach, finding that the transaction is not for fair consideration. But if courts would regard leveraged buyouts in general as satisfying the fair consideration test, then they could use the second prong to assess the *specific* effects of a leveraged buyout. The law could thus police suspect transactions (those that result shortly in insolvency) without undermining the entire financing device.

Relational Theory and Secured Financing

I just want to highlight the fascinating question left untouched by Normandin's paper. As debt contracts become more relational, not only do creditors share more downside risks but they also share more of the upside. This can be seen in the associated returns from financing a successful venture over time. In order fully to exploit the returns from financing growth opportunities, firms issue secured debt which functions to cement the relational contract and reduces costly conflicts of interest (including underinvestment or shirking). The value of wrap-around security (asset-based financing) is in the de facto control (the arm-twisting) given to creditors.

This control is essentially benign if we properly understand the

function of the relationship. Nevertheless, fear of de jure control and its associated liabilities drives the relationship underground, into a type of "silent" partnership. In turn, we begin to see the very problems that we began with—where the legal categories no longer clearly represent the underlying function of legal regulation and, in time, the function gets lost.

Still Searching for Optimal Capital Structure

*Stewart C. Myers**

The optimal balance between debt and equity financing has been a central issue in corporate finance ever since Modigliani and Miller (1958) showed that capital structure was irrelevant. Thirty years later their analysis is textbook fare, not in itself controversial. Yet in practice it seems that financial leverage matters more than ever. I hardly need document the aggressive use of debt in the market for corporate control, especially in leveraged buyouts, hostile takeovers, and restructurings. The notorious growth of the junk bond market means by definition that firms have aggressively levered up. In aggregate there appears to be a steady trend to more debt and less equity.

Of course none of these developments disproves Modigliani and Miller's irrelevance theorem, which is just a "no magic in leverage" proof for a taxless, frictionless world. Their practical message is this: if there is an optimal capital structure, it should reflect taxes or some specifically identified market imperfections. Thus, managers are often viewed as trading off the tax savings from debt financing against costs of financial distress, specifically the agency costs generated by issuing risky debt and the deadweight costs of possible liquidation or reorganization. I call this the "static trade-off" theory of optimal capital structure.

My purpose here is to see whether this or competing theories of optimal capital structure can explain actual behavior and current events in financial markets, particularly the aggressive use of debt in leveraged buyouts, takeovers, and restructurings. I will consider the static trade-

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off theory, a pecking order theory emphasizing problems of asymmetric information, and a rough, preliminary organizational theory that drops the assumed objective of market value maximization.

In the end, none of these theories is completely satisfactory. However, the exercise of trying to apply them forces us to take the firm's point of view and to think critically about the factors that may govern actual decisions.

I will not describe or document current events in detail here. The tendency to substitute debt for equity, at least by mature, cash-cow public firms, is evident from casual observation. The gains to investors from leveraged buyouts, restructurings, and leveraged takeovers have been summarized by Jensen (1986) and others. Taggart (1985) describes the trend to higher debt ratios for nonfinancial corporations generally.

Nor will I worry about the dividing line between debt and equity. That line is obviously important for tax or legal purposes, but it does not exist in finance theory. Every corporate debt security is part equity if there is any chance at all of default; it is (locally) equivalent to a weighted average of a default-risk-free debt and a pure equity claim on the firm's assets. The more debt the firm issues, holding assets, earnings, and future opportunities constant, the greater the equity content. Thus, "How much should the firm borrow?" is the same as asking how much implicit equity lenders should be induced to hold. When this conference's title asks, "Are distinctions between equity and debt disappearing?" finance theory answers, "Of course. Riskier debt is more like equity. Now let's get on to the real issue: Why are companies borrowing more?"

The following sections of the paper are devoted to the static trade-off, pecking order, and organizational theories.[1] The final section briefly summarizes what these theories can say about actual firm behavior and offers a few comments on "current events."

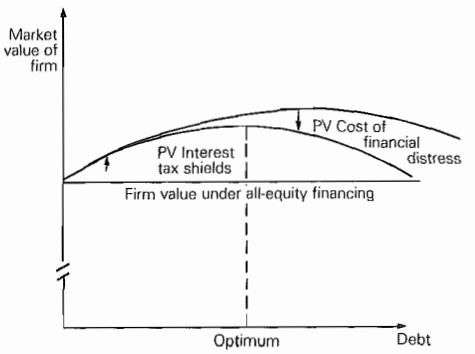
The Static Trade-off Theory

Figure 1 summarizes the static trade-off theory. The horizontal base line expresses Modigliani and Miller's idea that V, the market value of the firm—the aggregate market value of all its outstanding securities—should not depend on leverage when assets, earnings, and future investment opportunities are held constant. But the tax deductibility of

[1] Please understand that this is not a self-contained survey article. I have stated theories intuitively and have not attempted to derive them. I have attempted to cite interesting and representative research by others but have nevertheless skipped over many useful empirical and theoretical contributions. See Masulis (1988) for an extensive survey and bibliography.

Figure 1

The Static Trade-Off Theory of Capital Structure



interest payments induces the firm to borrow to the margin where the present value of interest tax shields is just offset by the value loss due to agency costs of debt and the possibility of financial distress.

The static trade-off theory has several things going for it. First, it avoids corner solutions and rationalizes moderate borrowing with a story that makes easy common sense. Most business people immediately agree that borrowing saves taxes and that too much debt can lead to costly trouble.

Second, closer analysis of costs of financial distress gives a testable prediction from the static trade-off story; since these costs should be most serious for firms with valuable intangible assets and growth opportunities, we should observe that mature firms holding mostly tangible assets should borrow more, other things constant, than growth firms or firms that depend heavily on R & D, advertising, and the like. Thus, we would expect a pharmaceutical company to borrow less than a chemical manufacturer, even if the business risks of the two firms (measured by asset beta, for example) are the same. This predicted inverse relationship between (proxies for) intangible assets and financial leverage has been confirmed by Long and Malitz (1985).

The static trade-off theory may also seem to draw support from studies of the reaction of stock prices to announcements of security

issues, retirements, or exchanges. Smith's (1986) summary of this research shows that almost all leverage-increasing transactions are good news, and leverage-decreasing transactions bad news. Thus, announcements of common stock issues drive down stock prices, but repurchases push them up; exchanges of debt for equity securities drive up stock prices, but equity-for-debt exchanges depress them. These impacts are often striking and generally strong enough to bar quibbles about statistical significance.

These "event studies" could be interpreted as proving investors' appreciation of the value of interest tax shields, thus confirming the practical importance of the static trade-off theory's chief motive for borrowing. But on balance this evidence works against the theory. First, the competing pecking order theory can explain the same facts as the market's rational response to the issue or retirement of common equity, even if investors are totally indifferent to changes in financial leverage. This point is discussed further in the next section.

Second, the simple static trade-off theory does not predict what the event studies find. If the theory were true, managers would be diligently seeking optimal capital structure, but find their firms bumped away from the optimum by random events. A couple of years of unexpectedly good operating earnings or the unanticipated cash sale of a division might leave a firm below its optimum debt ratio, for example; another firm suffering a string of operating losses might end up too highly levered.

Thus we would expect to observe some firms issuing debt and/or retiring equity to regain the optimal debt ratio; they would move to the right, up the left-hand side of Figure 1. But other firms would be reducing leverage and moving to the left, up the right-hand slope of the figure. The movement should be value-increasing in both cases, and good news if it is news at all.

It is possible, of course, that the leverage-increasing transactions reflect reductions in business risk and increases in target debt ratios. If investors cannot observe these changes directly, then a debt-for-equity exchange is good news; it demonstrates management's confidence in the level and safety of future earnings.

It is also possible that managers are not value-maximizers and do not attempt to lever up to the optimum. If most firms are sitting comfortably but inefficiently on the left of the upward-sloping "V curve" in Figure 1, then any increase in leverage is good news, and any decrease bad news. However, we cannot just explain away the event study results without thinking more carefully about how a "managerial" firm would want to arrange its financing. This too is left to a later section of the paper.

The most telling evidence against the static trade-off theory is the strong inverse correlation between profitability and financial leverage.

Within an industry, the most profitable firms borrow less, the least profitable borrow more. Kester (1986), in an extensive study of debt policy in United States and Japanese manufacturing corporations, finds that return on assets is the most significant explanatory variable for actual debt ratios. Baskin (1989) gets similar results and cites about a dozen other corroborating studies.

To repeat: high profits mean low debt. Yet the static trade-off story would predict just the opposite relationship. Higher profits mean more dollars for debt service and more taxable income to shield. They should mean higher target debt ratios.

Could the negative correlation between profitability and leverage reflect delays in firms' adjustments to their optimum debt ratios? For example, a string of unexpectedly high (low) profits could push a firm's actual debt ratio below (above) the target. If transaction costs prevent quick movements back to the optimum, a negative correlation is established—a negative correlation between profitability and deviations from target debt ratios.

This explanation is logically acceptable but not credible without some specific theory or evidence on how firms manage capital structures over time. Expositions of the static trade-off story rarely mention transaction costs;[2] in fact they usually start by accepting Proposition I of Modigliani and Miller (the flat base line in Figure 1), which assumes that transaction costs are second-order.

None of the evidence noted so far justifies discarding the static trade-off theory. However, it is foolish not to be skeptical. The theory sounds right to financial economists, and business people will give it lip service if asked. It may be a weak guide to average behavior. It is not much help in understanding any given firm's decisions.

The Pecking Order Theory

The pecking order theory of capital structure says that:

(1) Dividend policy is "sticky."

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[2] One exception is the target adjustment models used in empirical studies of capital structure choice, for example by Jalilvand and Harris (1984). In these models, random events change actual capital structures, but transaction costs force firms to work back only gradually towards actual capital structures. Actual capital structures revert toward the mean.

These models work fairly well if one assumes that the static trade-off theory holds and that each firm has a well-defined target debt ratio. Unfortunately, the models work equally well when the firm has no target and follows a pure pecking order strategy. See Shyam-Sunder (1988). In other words, the models offer no support for the static trade-off theory against that competitor.

(2) Firms prefer internal to external financing. However, they seek external financing if necessary to finance real investments with a positive net present value (NPV).
(3) If firms do require external financing, they will issue the safest security first; that is, they will choose debt before equity financing.[3]
(4) As the firm seeks more external financing, it will work down the pecking order of securities, from safe to risky debt, perhaps to convertibles and other quasi-equity instruments, and finally to equity as a last resort.

In the pecking order theory, no well-defined target debt ratio exists. The attraction of interest tax shields and the threat of financial distress are assumed to be second-order. Debt ratios change when an imbalance of internal cash flow occurs, net of dividends, and real investment opportunities arise. Highly profitable firms with limited investment opportunities work down to a low debt ratio. Firms whose investment opportunities outrun internally generated funds are driven to borrow more and more.

This theory gives an immediate explanation for the negative intra-industry correlation between profitability and leverage. Suppose firms generally invest to keep up with industry growth. Then rates of real investment will be similar within an industry. Given sticky dividend payout, the least profitable firms in the industry will have less internal funds for new investment and will end up borrowing more.

The pecking order story is not new. There are long-standing concerns about corporations that rely too much on internal financing to avoid the "discipline of capital markets." Donaldson (1984) has observed pecking order behavior in careful case studies. But until Myers and Majluf (1984) and Myers (1984), the preference for internal financing and the aversion to new equity issues were viewed as "managerial" behavior contrary to shareholders' interests. These papers showed that managers who act solely in (existing) shareholders' interests will rationally prefer internal finance and will issue the least risky security if forced to seek outside funds.

The pecking order theory reflects problems created by asymmetric information, a fancy way of saying that managers know more about their firms than outside investors do. How do we know managers have superior information? Well, outside investors clearly think they do because stock prices react to firms' announcements of earnings, major

[3] Warrants would be even lower on the pecking order. However, warrants are usually issued in a package with debt—roughly equivalent to a convertible bond.

capital expenditures, exchange offers, stock repurchases, and the like. The market learns from managers' actions because the managers are believed to have better or earlier information.

Consider the following story:

(1) Because managers know more about their firms than outside investors do, they are reluctant to issue stock when they believe their shares are undervalued. They are more likely to issue when their shares are fairly priced or overpriced.
(2) Investors understand that managers know more and that they try to "time" issues.
(3) Investors therefore interpret the decision to issue as bad news; therefore, firms that issue equity can do so only at a discount.
(4) Faced with this discount, firms that need external equity may end up passing by good investment opportunities (or accepting "excessive" leverage) because shares cannot be sold at what managers consider a fair price.

This story has three immediate implications. First, internal equity is better than external equity. (Note that the static trade-off theory makes no distinction between equity from retained earnings and equity from stock issues.) Because dividends are sticky and debt service predetermined, retention of any excess operating cash flow is more or less automatic and does not convey information to investors.

Second, financial slack is valuable. It relieves managers' fear of passing by an outlay with positive net present value (NPV) when external equity finance is required, but shares can only be issued at a substantial discount to intrinsic value.

Financial slack means cash, marketable securities, and readily saleable real assets. It also means the capacity to issue (nearly) default-risk-free debt. If a new debt issue carries no default risk, potential investors do not have to worry about whether the firm as a whole is overvalued or undervalued by the market.

Third, debt is better than equity if external financing is required, simply because debt is safer than equity. Asymmetric information drives the firm to issue the safest possible security. This establishes the pecking order.

Why are safer securities better? Not because the manager always wants to issue them. On the contrary, when the market overvalues the firm, the manager would like to issue the most overvalued security: not debt, but equity. (Warrants would be even better.) If the market undervalues the firm, the manager would like to issue debt in order to minimize the bargain handed to investors.

But no intelligent investor would let the manager play this game. Suppose you are a potential buyer of a new security issue, either debt or

equity. You know the issuer knows more than you do about the securities' true values. You know the issuer will want to offer equity only when it is overvalued—that is, when the issuer is more pessimistic than you are. Would you ever buy equity if debt were an alternative? If you do, the issuer is guaranteed to win and you to lose. Thus you will refuse equity and only accept debt. The firm will be forced to issue debt, regardless of whether the firm is overvalued or undervalued.

Issuing safer securities minimizes the manager's information advantage. Any attempt to exploit this information advantage more aggressively will fail because investors cannot be forced to buy a security they infer is overvalued. An equity issue becomes feasible in the pecking order only when leverage is already high enough to make additional debt materially expensive, for example, because of the threat of costs of financial distress. If the manager is known to have a good reason to issue equity rather than debt and is willing to do so in some cases where the equity is actually underpriced, then purchase of new equity can be a fair game for investors, and issue of new equity becomes feasible despite the manager's information advantage.

In practice, the pecking order theory cannot be wholly right. A counterexample is generated every time a firm issues equity when it could have issued investment-grade debt. Nevertheless, the theory immediately explains otherwise puzzling facts, such as the strong negative association between profitability and leverage. It also explains why almost all corporate equity financing has come from retention rather than new issues.[4]

The pecking order model also explains why stock price falls when equity is issued. Myers and Majluf show that if the firm acts in the interest of its existing shareholders, the announcement of an equity issue is always bad news. So is an equity-for-debt exchange offer—not because the exchange reduces financial leverage, but because it amounts to a new issue of common stock. The fact that investors pay for the issue with an unusual currency (the issuing firm's previously outstanding debt securities) is irrelevant.

Conversely, a debt-for-equity exchange is good news not because it increases outstanding debt, but because it amounts to a repurchase of equity. If investors believe managers have superior knowledge, then their decision to repurchase signals optimism and pushes the stock price up.

Thus the pecking order theory neatly explains why equity issues reduce stock price, but plain-vanilla debt issues do not. If the probability of default is low, then managers' information advantage is not a major

[4] See Brealey and Myers (1988), Table 14-3, p. 313.

concern to potential buyers of a debt issue. The smaller the managers' advantage, the less information is released by the decision to issue. The pecking order theory would predict a small negative impact when a debt issue is announced (all corporate debt carries some default risk), but for most public issues the effect should be very small and likely to be lost in the noise of the market.

An Organizational Theory of Capital Structure

Both of the theories reviewed so far assume that managers act in their current stockholders' interests. This is a useful convention of modern corporate finance theory but hardly a law of nature.

Current events in the market for corporate control have revived analysis of the conflicts between managers and stockholders. Consider Jensen's "free cash flow" problem, the alleged natural tendency of firms with excess cash flow to waste it rather than pay it out to investors. "The problem," as Jensen says, "is how to motivate managers to disgorge the cash rather than investing it below the cost of capital or wasting it on organizational inefficiencies" (1986, p. 323).

Competition tends to punish such waste. We would not expect to find it in toughly competitive industries. But if product market competition does not do the job, then competition in the market for corporate control may take its place. U.S. automobile companies were forced to slim down their organizations by their Japanese competitors. However, the Japanese do not pump oil, and so U.S. oil companies were forced to diet by (actual or threatened) takeovers.

Suppose we accept for sake of argument that important divergences exist between organizations' and investors' interests. What does that say about the role financing decisions play in "current events"? Second, what help does it give us in understanding financing decisions made by corporations that are not "in play" or under threat in the market for corporate control? Let me address the second question now and return to the first in the next section. Here is a sketch of an organizational theory of capital structure.[5]

Table 1 presents an organizational balance sheet. This has no necessary, direct connection with the firm's books. It is just a way of expressing the identity between the market value of assets and liabilities.

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[5] I say "organizational" rather than "managerial" to emphasize my interest in the interests and behavior of the organization as a whole rather than the personal motives and decisions of a few people at the top of the corporate hierarchy.

Table 1
Organizational Balance Sheet
All Entries at Market Value

Present value (PV) of existing assets, pre-tax	PVA	Existing debt	D
PV growth opportunities, pre-tax	PVGO	Employees' surplus	S
Less: PV future taxes	−PVTAX	Existing equity	E
After-tax value	V	After-tax value	V

Corporate wealth = employees' surplus + equity
W = S + E

On the left is PVA, the present value of future cash flows from existing assets, plus PVGO, the present value of growth opportunities, less the present value of the government's tax claim, PVTAX. Note that PVGO can be negative if the firm is expected to waste money on negative-NPV capital investments or to overpay for acquisitions.

On the right are D, existing debt, E, equity, plus S, the present value of "employees' surplus." This surplus reflects the present value of perks, overstaffing, and above-market wages. (Note that PVA and PVGO are defined before this surplus is subtracted.)

Treynor (1981, p. 70) suggests that "the financial objective of the corporation is to conserve, and when possible, to enhance the corporation's power to distribute cash," which depends on the net market value of the firm. For a public corporation traded in well-developed capital markets, market value is fungible. Therefore the "power to distribute cash" is strictly proportional to net corporate wealth. This is the sum of equity and employee surplus, W = E + S.

Donaldson concluded from extensive case studies of mature public corporations that "the financial objective that guided the top managers of the companies studied [was] maximization of corporate wealth. Corporate wealth is *that wealth over which management has effective control* and is an assured source of funds . . . ." (1984, p. 22, emphasis in original).

Of course standard corporate finance theory also assumes the firm maximizes wealth. But it is shareholders' wealth. Standard theory says that dividend policy is irrelevant in perfect, frictionless markets because paying a dollar per share dividend reduces the share price by exactly a dollar; shareholders' wealth is unchanged. However, corporate wealth declines by a dollar per share. The dollar is no longer under the effective control of management.

I will briefly describe how several common financial decisions would be analyzed by a firm seeking to maximize corporate wealth. For

simplicity I will assume the manager has no information advantage and also that existing debt is (close to) default-risk-free, so no temptation arises to undertake transactions to undercut existing creditors.

Because corporate wealth is measured in terms of market value, rules for ranking capital investments are exactly the same as in standard finance theory. The firm always seeks positive net present value (NPV) and prefers more NPV to less.

Suppose the firm issues debt to finance additional capital investment projects that happen to have NPV = 0.[6] Then corporate wealth does not change: the market value of additional real assets is offset by the new debt liability. Thus debt financing would provide no incentive to overinvest in negative-NPV projects. Outside investors should see no bad signals in a debt issue earmarked for additional assets. This is consistent with the lack of response of stock prices to announcements of new debt issues.

However, an issue of debt that replaces equity, holding PVA and PVGO constant, decreases corporate wealth. As debt increases, corporate wealth, which is the sum of equity and employees' surplus, must go down. This could be good news for stockholders. First, PVTAX, the government's claim on the firm, could be significantly decreased by interest tax shields.

Second, employees' surplus would decrease, transferring value to the equity account. Employees' surplus is similar to a subordinated debt claim, whose market value falls when more senior debt is issued and inserted between the junior debt and the firm's assets. The employees' surplus is junior because creditors can usually force the firm to "go on a diet" if debt service is threatened. The diet squeezes out the perks, overstaffing and above-market wages that constitute employees' surplus.

Thus the organizational theory can explain why debt-for-equity changes are good news for stockholders. (Of course one has to accept that interest tax shields have significant value and that employees' surplus is an important entry on the organizational balance sheet.) The theory also predicts that firms will not undertake debt-for-equity exchanges except, say, under threat of a takeover.

An issue of equity that replaces debt would be bad news for investors. The reasoning is just as for a debt-for-equity exchange, with signs of course reversed. But would a new equity issue, or unanticipated retention of earnings, be bad news if the money is put to use on the asset side of the balance sheet? Yes, because employees' surplus increases.

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[6] The present value of interest tax shields on debt supported by the project is included in the project's NPV.

Remember that this surplus resembles a junior debt, whose value increases when the firm adds equity-financed assets. New equity investors anticipate this and adjust the purchase price of the new shares accordingly. The increase in surplus must therefore be extracted from existing equity.

The equity issue may be even worse news if the proceeds are not productively invested. If $10 million is raised and invested in a project with a value of only $6 million, existing shareholders lose $4 million (and also lose whatever the employees gain from appreciation in the value of their junior claim). Other things constant, corporate wealth nevertheless increases by $6 million.

Thus, the negative stock market reaction to equity issues is guaranteed if one assumes that marginal investments are negative-NPV. But why should the corporate-wealth-maximizing firm ever accept a negative-NPV project? Why not issue equity and buy marketable securities, which presumably have NPV = 0? Then a $10 million equity issue should add $10 million to corporate wealth.

This is not an easy question for the organizational theory, but some answers are possible. First, buying marketable debt securities amounts to lending money. If borrowing has a significant tax advantage, there must be a corresponding disadvantage to lending. Thus investment in a Treasury bill should have NPV < 0 after tax. Second, if another company's equity securities are purchased, an additional layer of taxation is created, which should drive NPV negative. This layer of tax is eliminated if the other company is taken over, but takeovers not motivated by real economic gains are also likely to be negative-NPV once transaction costs and takeover premiums are recognized.

Assume, then, that outlets for investment with at least zero NPV are limited. That limit defines the maximum scale of a shareholder-value-maximizing firm. What limits the scale of a firm that maximizes corporate wealth? It seems that any new equity issue inevitably increases corporate wealth, regardless of whether the proceeds are used to repay debt or add to assets. (Corporate wealth is also increased if earnings are retained rather than paid out as dividends.) This is so even if the assets' NPVs are negative, so long as they have any value at all. Why doesn't the firm issue more and more equity, expanding and generating practically unlimited corporate wealth? If corporate wealth is the objective, the firm does not care about the price of new shares.

This, too, is not an easy question. One can appeal to the threat of takeover by other firms seeking to maximize their own corporate wealth by preying on other firms with large employee surpluses or substantial negative-NPV investments. However, takeovers did not appear as a significant threat to large public corporations until relatively recently. One can also note the compensation schemes of top management,

whose fortunes are tied more closely to equity earnings and stock prices than those of most of their employees.

The deeper answer is that corporate wealth is in the end not determined by the corporation but by investors. Only market value can be translated into "the power to distribute cash." That depends on what investors are willing to pay.

The only reason they are willing to pay anything at all, absent the threat of takeover, is that the firm has somehow bonded itself to distribute cash to shareholders. Obviously the bond is not contractual, as it is with debt, but implicit. Presumably this is the reason why firms have fairly well-defined, sticky dividend policies, and also why top managers accept compensation schemes linked to stock prices, despite the otherwise diversifiable risk this forces them to carry.

A stock issue increases equity value only if this bonded or "promised" future payout increases. Consider the two extreme cases. First, suppose that the firm issues $10 million in new equity but does not "promise" to pay out any additional future dividends. Then existing shareholders must absorb a $10 million capital loss. In other words, the decision to issue new stock breaks the firm's "promise" to old shareholders. But having just broken that promise, it is not clear where the firm would find any rational new shareholders. In other words, an equity issue would probably be infeasible.

At the other extreme, the firm could accept an implicit obligation to pay out additional future dividends with a present value of $10 million. This fully "covers" the newly issued shares, so existing shares maintain their value. Total equity value increases by $10 million.

Corporate wealth also increases by $10 million. However, not much of this goes to employees. The firm has $10 million more in assets but has also promised $10 million to new shareholders. Nothing is left over for employees' surplus, except for the transfer to surplus from existing equity, which occurs because employees now hold better-protected junior claims on the firm's assets. (Note that this transfer could explain the markets' negative reaction to stock issues.)

Perhaps this tells us why firms prefer to accumulate retained earnings rather than to issue shares. Suppose the firm has "promised" to pay out dividends according to some sticky rule. Then if earnings are higher than anticipated, much of the increase is free for employees to deploy; it has not been promised to shareholders. On the other hand, if an unanticipated shortfall occurs, dividends are to some extent protected, and the firm may have to turn to outside financing for real investment.

This begins to look like a pecking order, at least with respect to a preference for internal versus external financing. Thus the organizational theory of capital structure may be able to explain why the most

profitable firms typically borrow the least. Their higher than "normal" or expected earnings are retained because their contract with stockholders does not require them to be paid out. If real investment opportunities do not increase proportionally to earnings—as is likely for mature firms—then high earnings mean greater retention, less reliance on external financing, and presumably a lower debt ratio.[7]

The organizational theory also seems to explain stock market reactions to announcements of security issues, retirements, and exchanges. Overall it is a promising alternative to capital structure theories based on shareholder wealth maximization.

Yet caution is called for. I have not been able to develop the theory fully and formally in this paper. I have not analyzed the implicit contract between the firm and its shareholders or attempted a link-up to the literature on dividend policy. I have compared employees' surplus to a junior debt liability without giving a detailed description of the properties of this claim, and I have implicitly treated employees' surplus as a kind of tax that does not reduce the potential value of existing assets and growth opportunities. This is almost certainly oversimplified.

Finally, I have accepted Treynor's and Donaldson's suggested objective of maximizing corporate wealth. The discussion above of equity issues and the firm's implicit contract with shareholders suggests that maximizing corporate wealth may not always be in the employees' interest, even if all employees could act as one.

Conclusions

This paper has briefly reviewed three theories—perhaps I should say stories—of capital structure. I have tried to match them to firms' actual behavior and to judge their ability to explain the two most striking facts about corporate financing.

The first fact is that investors regard almost all leverage-increasing security issues or exchanges as good news, and leverage-decreasing transactions as bad news. The only exception is plain-vanilla debt issues, which apparently are no news at all. The second fact is the strong negative correlation between profitability and financial leverage.

The widely cited static trade-off theory, taken literally, explains neither fact. It is at best a weak guide to average behavior.

The pecking order theory is a minority view that seems to explain the two striking facts.

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[7] I admit that the organizational theory does not fully explain why firms should prefer debt to equity if external financing is sought.

The organizational theory described in this paper is a first try at restating Jensen's free cash flow theory of the market for corporate control as a general theory of capital structure choice. It also explains the two striking facts, though its predictions are not as clear and definite as those of the pecking order model. A more thorough and formal development of the organizational theory is obviously needed.

The initial plausibility of the organizational theory derives from current events, particularly the aggressive use of leverage in leveraged buyouts, takeovers, and restructurings. The leading explanation for this is that high debt ratios are necessary to force mature companies on a diet and to prevent them from making negative-NPV capital investments or acquisitions. The debt is viewed as a contractual bond that forces the firm to distribute cash to investors.

The organizational theory is an extension of this argument, and therefore broadly consistent with current events. The static trade-off theory gives no help with current events unless it is assumed that target firms are systematically underleveraged and therefore not maximizing market value. But in that case the static trade-off theory is no more than an open invitation to develop an organizational theory.

Thus, the race to explain capital structure really has only two contenders: models such as the pecking order theory that assert asymmetric information as the chief underlying problem, and models that start from the proposition that organizations act in their own interests.

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Discussion

*O. Leonard Darling**

I have to compliment Stewart Myers on his paper. Even a nonacademic type such as myself could read it and understand his salient points. I am encouraged that research is being done on this important subject, how to determine the optimal capital structure. I was also more than slightly relieved to find out that academia has not yet resolved this question. The young investment bankers I have met in recent years have all been quite sure that they had just created the optimal capital structure. I am relieved that many of the bizarre capital structures proposed are not blessed by academia.

I would like to twist on the discussant's role slightly, and instead of trying to comment on theories that Myers has discussed, I would like to apply these theories to what I see happening in corporate America. Let me begin by saying that the most leveraged corporations are in the process of "de-leveraging." In the entire postwar period, corporations have been increasing their leverage. Increased leverage has been a successful way of increasing shareholder wealth. In recent years, much of this increase has been used to retire common stock. The format of debt-for-equity exchanges has usually resulted in significant premiums paid to shareholders over prevailing market values. The optimal capital structure has been viewed as one of maximum debt.

I believe the real challenge today is how to de-leverage these corporations in order to reach the optimal capital structure. Clearly, we have passed the apex of the value-of-the-firm curve that Myers depicts

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in his Figure 1, which supports the static trade-off theory. The financial distress caused by excessive leverage has reduced the total market value of all the firm's securities to a point that falls below the maximum theoretical value. Clearly, it makes sense for these firms to de-leverage. In my opinion, how these corporations move back from over-leverage to a more satisfactory capital structure depends in large part on whether they are publicly or privately held.

Before departing to the specific subject of de-leveraging individual companies, let me make some general comments on why excessive leverage—specifically the use of high-yield debt in leveraged buyout transactions—is and will continue to be on the decline. The high-yield market is in disarray. The cost of high-yield debt is at historic highs relative to either investment-grade debt or equity. In the past two years the stock market has moved up sharply from the lows of October 1987, and interest rates on high-quality paper have declined by more than 200 basis points. During this period the interest rate on new high-yield debt has increased slightly. The imbalance between the amount of debt buyers can absorb and the supply of new paper has created a logjam of unsold new issues. The problems surrounding recent leveraged buyout statements of liquidity shortfalls have further reduced the number of potential buyers for leveraged buyout or high-risk paper. If it makes sense for the most leveraged corporations to de-leverage, then it must make equal sense for those contemplating excessive leverage to rethink their plans. Certainly, the bright young investment banker must now have better advice for his clients than to incur the cost of selling high-yield debt.

Turning back to the issue of de-leveraging the financially distressed company, it is important to consider whether the company is publicly owned or privately owned. I believe different theories govern, depending on ownership. De-leveraging a public company may be more difficult and require a different course of action than de-leveraging a private company.

De-leveraging a public company must be done in a way that continues to maximize shareholders' value throughout the process. Otherwise, the firm runs the threat of an outsider buying controlling shares in the marketplace and replacing management. Another consideration in de-leveraging a public company is that new equity may be necessary to help retire debt. Clearly, it is important to try to keep shareholders' values as high as possible during this process. As Myers' Figure 1 points out, the total market value of the firm's securities is reduced by excessive leverage. The static trade-off theory described in his paper appears to best explain this process, as firms located in the financially distressed area of Figure 1 move to the left on Figure 1, increasing the value of the firm.

De-leveraging a private company is quite different. A private firm is often owned by management who have borrowed money to acquire the firm and are primarily concerned with maximizing their personal wealth over a long time span. They are less concerned with the day-to-day value of the stock and are quite willing to trash (reduce the value of) their outstanding debt if it allows them the opportunity to buy back this debt at a lower price. In essence, the shareholder benefits from capturing the decline in the market value of the debt. Without the constraints of a publicly quoted common stock (fear of the stock price dropping and a hostile tender offer), the battle between bondholders and shareholders can get quite fierce. Myers' organizational theory hypothesizes that shareholders attempt, through leverage, to capture employees' surplus. By retiring subordinated debt at large discounts, the shareholders are similarly capturing the bondholders' surplus.

Let me talk about a couple of practical examples and try to relate them to these theories. Bob Price, CEO of Price Communications (a publicly held corporation) is in the process of de-leveraging his company by selling $50 million of 10 percent convertible bonds and, with the proceeds, buying back his high-yield debt that yields approximately 20 percent and sells at a significant discount from par value. Bob was an investment banker before he started Price Communications, and he has cleverly walked the fine line that allows him to sell equity securities at an attractive price while he simultaneously buys back his high-yield debt at substantial discounts. Bob is moving to a more functional capital structure without damaging his stock price, a difficult feat when one considers the relatively low opinion the bondholders have of the company. It is interesting that Price Communications' stock has been an excellent performer over the past few years.

De-leveraging a private company can be far more difficult and painful for the debtholders. Robert Campeau's method of dealing with the over-leverage in his Allied and Federated Companies is far more ruthless. Without public shareholders of Allied and Federated to worry about, Campeau announced in early September that his companies were experiencing liquidity problems and that in exchange for an infusion of capital from the parent he expected to buy back the publicly traded high-yield debt at the prices at which the debt was trading on that date. Naturally, following on the heels of the announcement about the lack of liquidity, the debt of these subsidiaries was selling at bankruptcy levels. I read that Campeau believed he had overpaid for Federated by $300 million. By mid-September, the market value of Federated's high-yield debt had declined by more than that amount. Mr. Campeau would obviously prefer that debtholders suffer the loss, rather than himself. This is a classic example of shareholders increasing their value at the

expense of the debtholders. I am sure that the bondholders have other thoughts, and I do not expect an easy resolution.

The bankruptcy courts may well resolve issues such as those presented by the Campeau dilemma. This thought is less than comforting to bondholders in light of the recent intrigue surrounding Revco. Revco was an early leveraged buyout that was capitalized at $1.5 billion in debt and $19 million in equity and entered bankruptcy within one year of the buyout. As the legal panel at this conference pointed out earlier, normally all classes of debt must consent to a reorganization plan. However, in this case management are attempting to force a reorganization plan that is unfavorable to the bondholders. Management intend to inject new money into the company ($150 million) and argue that this allows them to force bondholders to settle on management's terms. Management's unilateral proposal would wipe out $600 million of the current $800 million in high-yield debt. If this were allowed by the court, it would become increasingly difficult to issue high-yield debt, as it would be obvious that the bondholders were assuming all the downside risk while receiving very little of the upside potential.

The situation in corporate America is clear. The most leveraged of corporations must de-leverage. The total value of the firm is being penalized by excess debt. The optimal capital structure requires more equity and less debt. Private companies are most likely to de-leverage through confrontation with debtholders, while public companies will attempt to move back from an overly leveraged position to the optimal capital structure by some form of equity financing.

Again, I thank Stewart Myers for his continuing research and also for his contribution to my own understanding of the optimal capital structure.

Discussion

*Robert A. Taggart, Jr.**

It is an honor to be asked to discuss Stewart Myers' paper, but at the same time it is a somewhat daunting task in view of his many important contributions to capital structure research. These contributions include "Problems in the Theory of Optimal Capital Structure" (1966, with Alexander Robichek), "Determinants of Corporate Borrowing" (1977), "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have" (1984, with Nicholas Majluf), and his Presidential Address to the American Finance Association, "The Capital Structure Puzzle" (1984). What I would like to do first is try to place his current paper in the context of these previous contributions.

Each of the four papers that I mentioned deals with capital market frictions, or imperfections, and their impact on corporate financing decisions. That is a natural starting point, since we know from Modigliani and Miller's (1958) seminal paper that corporate financing decisions have no impact on firm value in the absence of these frictions. While many of Modigliani and Miller's critics have pointed to the potential importance of market frictions, Myers' repeated contribution has been to show how and why they can affect corporate decisions in the framework of an economic model that includes maximizing behavior on the part of all participants. At the same time, his view of how these frictions operate has undergone continual alteration. Indeed, a second hallmark of Myers' work has been his willingness to take issue with his own previous work.

In the two earlier papers, "Problems in the Theory of Optimal

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Capital Structure" and "Determinants of Corporate Borrowing," Myers helped develop what he now calls the "static trade-off" theory. The first of these papers emphasized the costs of bankruptcy and financial distress as counterweights to the tax benefits of debt. The second paper provided a broader interpretation of these costs by showing that the very possibility of bankruptcy could cause even a currently healthy firm to make suboptimal investment decisions if it had a sufficient amount of debt outstanding.

In "The Capital Structure Puzzle," however, Myers began to emphasize the lack of empirical support for the static trade-off theory and proposed as an alternative the "pecking order" theory. As he pointed out at the time, this represented in some ways the resurrection of earlier conclusions on the subject by a variety of scholars and business observers. Rather than adopting their implicit model of managerial discretion, however, he emphasized the inherent informational advantage that corporate managers have over investors (Myers and Majluf 1984). The result was a model of rational, value-maximizing behavior that was consistent with two salient empirical facts: (1) the stock market's negative reaction to new stock issues and positive reaction to the substitution of debt for equity and (2) the negative relationship between firm profitability and debt proportions.

The current paper is very much in the tradition of Myers' previous work. First, it reexamines and challenges the conclusions from his own earlier papers in the light of recent developments. Second, it calls for a closer analysis of ideas that have long been present in informal discussion but have yet to be incorporated in a rigorous model.

Turning first to the challenge from recent developments, it is becoming increasingly clear that the 1980s have witnessed a departure from the previously normal pattern of corporate financing. This is illustrated in Table 1, which shows some financing ratios for U.S. nonfinancial corporations during the post–World War II era, divided into intervals of roughly five years each. Prior to 1984, a pecking order model is quite consistent with the data. New stock issues are never more than a minor source of funds. More important, debt rises as a proportion of total sources of funds only when internal funds fall relative to capital expenditures. This is exactly what one would expect to observe if corporate managers turned to internal funds first, used debt second, and relied on new equity only as a last resort. Since 1984, however, the use of debt financing has increased at the same time that internal funds have been plentiful relative to investment needs. The increased debt has in turn helped finance a dramatic net retirement of corporate equity.

The pecking order theory, especially as rationalized by the asymmetry of information between investors and corporate managers, is hard-pressed to explain this unusual pattern. It is true that empirical

Table 1
Financing Ratios for U.S. Nonfinancial Corporations in the Post–World War II Period

Period	Ratio to Total Funds Sources:			Ratio of Internal Funds to Capital Expenditures
	New Debt	Stock Issues	Internal Funds	
1945-49	.30	.05	.65	.84
1950-54	.31	.06	.63	.82
1955-59	.31	.04	.65	.90
1960-64	.30	.02	.69	.96
1965-69	.40	.01	.59	.81
1970-74	.47	.05	.48	.70
1975-79	.38	.01	.60	.91
1980-84	.34	−.02	.68	.91
1984-88	.45	−.18	.73	.98

Source: Board of Governors of the Federal Reserve System.

studies find a positive stock market reaction to the exchange of debt for equity, but what has suddenly motivated corporate managers to make this exchange? The asymmetric information version of the pecking order theory, which emphasizes the value of financial slack, has a difficult time rationalizing such a major reduction in financial slack. A possible explanation is that financial innovation and lower costs of managing financial distress have reduced the optimal amount of financial slack for many firms. For example, increased access to public debt markets, such as the commercial paper, Eurobond and junk bond markets, may have made it easier to raise new funds in a hurry. In addition, credit enhancement techniques and more concentrated lending structures, as in leveraged buyouts, may have made it easier for even those firms in financial distress to raise new funds and keep operating. This explanation, however, does not seem to fully confront the fact that a significant portion of the recent exchange of debt for equity has been associated with the "corporate restructuring" phenomenon. What is needed, apparently, is a model that predicts pecking order financing behavior in normal times, but is also capable of predicting changes in behavior during periods of upheaval.

I would interpret Myers' formulation of the "organizational" theory, in fact, as a plea for a closer look at the determinants of pecking order behavior so that departures from that behavior can be more readily predicted. On this score, then, it might be useful to note that at least three different stories have been used to rationalize pecking order behavior. First is the asymmetric information story that has been emphasized in Myers' own previous work. Unless some dramatic revision in the value of financial slack has occurred, this story seems

unable to explain the changes in financing behavior that have resulted from corporate restructuring.

Second is a tax story (Stiglitz 1973, for example). The basic idea here is that, for many configurations of corporate and personal taxes, it is better to retain and reinvest a dollar of corporate earnings than to pay it out and then raise new funds from investors who, in the aggregate, have already paid taxes on this distribution. This personal tax penalty is less severe if the distribution takes the form of a share repurchase rather than a cash dividend. (Even though ordinary income and capital gains are taxed at the same rate under the current tax law, investors at least have a choice of whether to realize or defer their gains with a stock repurchase.) If new funds are raised in the form of debt, the associated interest tax shield may also offset this personal tax penalty, at least partially. Hence, if new funds are raised at all, debt will be favored to new equity. However, unless the tax penalty on the distribution can be overcome, retained earnings will be favored over new securities issues of either type.

This tax story thus predicts a pecking order type of financing behavior, and it is also capable of predicting changes in that behavior as either the tax code or perceptions of Internal Revenue Service rule enforcement change. Certain aspects of the Tax Reform Act of 1986 (for example, the reduction of all personal tax rates below the corporate rate) could be interpreted as increasing the net tax advantage of corporate debt, and at the same time, corporations have been less reluctant to distribute funds in the form of stock repurchases in recent years. Taken together, these facts might be argued to have shifted the balance of tax factors more toward debt financing. However, as Alan Auerbach (1989) argues in his paper, the time of the change in corporate financing behavior does not quite fit with that of the tax code changes, and it is difficult to interpret the increase in equity retirements as primarily a substitution for dividend payments. Thus the tax story, too, seems incapable of fully explaining the shift in corporate financing behavior that has occurred since the mid-1980s.

The third, and oldest, story that has been used to rationalize pecking order financing behavior involves corporate managers' desire to shield themselves from the scrutiny and discipline of the capital market. Internal funds, which bring no additional scrutiny, are thus said to be the best source of funds for new investment, followed by debt and, finally, by equity. Managers would also presumably change their behavior in the face of some exogenous increase in capital market pressure, as in a wave of takeover threats, for example. This managerial discretion story leaves out the investor side of the equation, however, and is thus unable to explain why such pressure would lead managers to retire already outstanding equity for debt.

The organizational theory that Myers sets forth is most closely akin to this managerial discretion story, but it improves upon it by bringing in the investor side of the equation. It can thus explain why a debt-for-equity exchange can increase shareholder wealth at the same time that it decreases employees' surplus. I think the point that "corporate wealth is in the end not determined by the corporation but by investors" is especially worthy of further development, since it hints at ways in which the capital market may limit managerial discretion, even apart from such mechanisms as shareholder voting power and corporate takeovers. It also suggests to me that the organizational theory may be complementary to the asymmetric information version of the pecking order theory. Shareholders will react to news of a stock issue, say, in the knowledge not only that corporate managers may have superior information but also that the managers' objectives are not perfectly aligned with their own. What remains to be established more precisely is where the valuation process itself begins to impinge on managerial discretion.

I am also intrigued by the characterization of employees' surplus as a subordinated debt claim. This is similar to the way other implicit claims on the firm by customers, suppliers, and even the local community have been characterized (see Titman 1984; Cornell and Shapiro 1987), but the difference is that the managers have a more direct influence over the value of their claim. As above, I think one of the issues to investigate further is how the limits to that influence are established. It is clear that events such as takeovers and voluntary restructurings can sharply erode the value of the employees' surplus. What is less clear is how the day-to-day stock market valuation process circumscribes the value of the employees' surplus or of other implicit claims.

While Myers has emphasized that a good deal of fleshing out remains to be done, he has pointed to an interesting and promising path that corporate capital structure would do well to explore more thoroughly. His assignment in the conference program has been to present the firm's view of debt and equity, and he has responded by suggesting that finance theory might do well to look at that view as logically distinct from, although inextricably related to, the capital market's view. In the end, this path may lead to a better understanding not only of corporate financing decisions, but of the very nature of the corporate form of organization.

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The Lender's View of Debt and Equity: The Case of Pension Funds

*Zvi Bodie**

> It is by no means clear that the demand and supply for financial assets by opaque institutions simply reflect retail forces. In the prevailing equilibrium models of securities markets, demand comes from the individuals solving portfolio optimization problems. However, when we take account of the intervening contractual relations under which opaque institutions operate, it seems heroic to think that they mirror these forces (Ross 1989, p. 543).

In the past fifteen years, starting in 1974, we have seen an unprecedented wave of financial innovation in United States capital markets. The main areas of innovation have been the securitization and repackaging of debt and the emergence of derivative securities markets. The purpose of this paper is to show how some of these developments can be explained by the nature of the benefits guaranteed by defined benefit pension plans and the investment strategies they employ to hedge their liabilities.

In 1988, assets of pension plans amounted to almost $2.5 trillion. Most of this money was invested in debt and equity securities. Pension funds accounted for about 25 percent of the total holdings of common stock and 39 percent of the total of corporate and foreign bonds. It is not surprising, therefore, that the investment policy of pension funds has had a profound effect on the direction and rate of innovation in the capital markets.

Perhaps the most striking and surprising development has been the

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emergence of new securities and markets designed to provide long-duration, dollar-denominated cash flows. Examples are the markets for zero coupon bonds, collateralized mortgage obligations (CMOs), and guaranteed investment contracts (GICs).[1]

From the perspective of household lifetime utility maximization, it is hard to see why much of a demand would arise for such securities. Economic theory would suggest that households want securities that hedge against the main sources of risk to their future stream of consumption. A long-term nominal bond has little value as a hedge against the risks faced by households because it is so vulnerable to inflation risk.

This paper traces the demand for long-duration, dollar-denominated debt to the nature of the benefits guaranteed by defined benefit pension plans and to the immunization strategies they employ to hedge their liabilities. It also explains the emergence of options and financial futures markets along similar lines. It then explores several possible explanations for the failure of pension plans to provide automatic protection against inflation risk. The analysis focuses on corporate pension plans, but most of it applies as well to state and local government defined benefit plans.

An important theme underlying this paper is that most of the innovations discussed herein were not the creations of the nonfinancial corporations issuing the primary debt and equity securities. Instead they were created by financial intermediaries, which transformed these primary securities into the types of claims that pension funds wanted to hold. This points out an important fact: the portfolio demands of lenders do not necessarily determine the type of securities issued by the ultimate borrowers.

The Nature of Defined Benefit Pension Liabilities

Although employer pension programs vary in design, usually they are classified into two broad types: defined contribution and defined benefit. These two categories are distinguished in the law under the Employee Retirement Income Security Act (ERISA).

The defined contribution arrangement is conceptually the simpler of the two. Under a defined contribution plan, each employee has an account into which the employer and the employee (in a contributory plan) make regular contributions. Benefit levels depend on the total

[1] See Smith and Taggart (1989) for a discussion of the major innovations in the fixed-income area.

contributions and investment earnings of the accumulation in the account. Defined contribution plans are in effect tax-deferred retirement savings accounts held in trust for the employees.

Contributions usually are specified as a predetermined fraction of salary, although that fraction need not be constant over the course of a career. Contributions from both parties are tax-deductible, and investment income accrues tax-free. At retirement, the employee typically receives an annuity whose size depends on the accumulated value of the funds in the retirement account.

Often the employee has some choice as to how the account is to be invested. In principle, contributions may be invested in any security, although in practice most plans limit investment options to various bond, stock, and money market funds. The employee bears all the investment risk; the retirement account is by definition fully funded, and the firm has no obligation beyond making its periodic contribution.

In a defined benefit plan, by contrast, the employee's pension benefit entitlement is determined by a formula that takes into account years of service for the employer and, in most cases, wages or salary. The plan sponsor guarantees this benefit regardless of the investment performance of the pension fund assets.

In a typical defined benefit plan, employees might receive a pension benefit equal to 1.5 percent of final salary per year of service less 1.25 percent of their Social Security benefit times years of service. Thus, an employee retiring after 40 years of service with a final salary of $50,000 per year and a Social Security benefit of $10,000 per year would receive a pension benefit of 60 percent of $50,000 less half of $10,000, or $25,000 per year.

The annuity promised to the employee is the employer's liability. The Pension Benefit Guaranty Corporation (PBGC), an agency of the U.S. government, guarantees the pension benefits promised under defined benefit plans up to certain limits. Plan sponsors pay insurance premiums that depend on the number of employees covered by the plan and on how well funded the plan is.

Large corporations usually offer a defined benefit plan as their primary pension plan and supplement it with voluntary defined contribution plans (called savings or profit-sharing plans). To encourage participation, the sponsor often makes matching contributions to these supplementary defined contribution plans, and the employee decides how to allocate the money. When a defined contribution plan is the primary pension plan, however, the employee often is not required to make any contributions, and the employer usually makes the asset allocation decisions.

In a defined benefit plan, the assets serve as collateral for the firm's pension liabilities. Traditionally, pension funds have been viewed as

separate from the corporation. Legally these funds are trusts, and funding and asset allocation decisions are supposed to be made in the best interests of the beneficiaries, regardless of the financial condition of the sponsoring organization.

The pensions offered under a defined benefit plan are best viewed as participating annuities that offer a guaranteed minimum nominal benefit determined by the plan's benefit formula. This guaranteed benefit is enriched from time to time at the discretion of management based on the financial condition of the plan sponsor, the increase in the living costs of retirees, and the performance of the fund's assets.

The evidence in support of this contention is that many plans have given ad hoc voluntary benefit increases to plan participants in the past (Clark, Allen, and Sumner 1983). While these increases have been viewed by many as evidence of implicit cost-of-living indexation, they are very different from a formal COLA or cost-of-living adjustment (Cohn and Modigliani 1985; Ippolito 1986). Rather, they are an implicit claim of the employees on the plan sponsor.

The implicit pension obligation is a very complex contingent claim, in both the economic and the legal sense. One way to view this contingent claim is as an employee ownership share in the pension fund surplus. In the case of corporate pension plans, it seems clear that if the sponsoring corporation does not do well financially, then employees cannot expect to get anything more than the minimum guaranteed formula benefit. Mounting evidence has shown that corporations facing severe financial difficulties, either because of low profitability or because they are under threat of hostile takeover, will raid their overfunded pension plans and give employees only the legal minimum (VanDerhei and Harrington 1989; Petersen 1989; Pontiff, Shleifer, and Weisbach 1989).

On the other hand, if the corporation does well financially, and if retired employees face inflation, then evidence suggests that the corporation will help them out with ad hoc benefit increases. It is for this reason that I have referred to this type of pension benefit as a participating annuity with a guaranteed floor. This floor is fixed in nominal terms because, unlike Social Security, no automatic indexation of benefits occurs either before or after retirement.

Both the Financial Accounting Standards Board (FASB) and the U.S. Congress have adopted the present value of the guaranteed nominal floor as the appropriate measure of a sponsor's pension liability. In FASB Statement 87, the rule-making body of the accounting profession specifies that the measure of corporate pension liabilities to be used on the corporate balance sheet in external reports is the accumulated benefit obligation—that is, the present value of pension benefits owed to employees under the plan's benefit formula absent any salary projections and at a nominal rate of interest.

In its Omnibus Budget Reconciliation Act of 1987 (OBRA), Congress defined the current liability as the measure of a corporation's pension liability and set limits on the amount of tax-qualified contributions a corporation could make as a proportion of the current liability. OBRA's definition of the current liability is essentially the same as FASB Statement 87's definition of the accumulated benefit obligation.[2]

Why Pension Plans Do Not Provide Inflation Insurance

Why are pension plans in the United States not designed to offer automatic inflation indexation? One reason frequently cited in the past was that plan sponsors had no way to hedge the risk through an appropriate investment strategy.[3]

While it is true that in the past no financial instruments offering a risk-free real rate of return have been issued in the United States, they would have come into existence, had there been a demand for them by pension funds. Several attempts by financial intermediaries to offer inflation- indexed investment products have failed, in large part because of lack of interest on the part of institutional investors like pension funds. Recently several financial institutions have introduced financial instruments linked to the CPI.[4] Their success or failure will put the "lack of inflation hedge" explanation to the test in the next several years.

Another explanation for the lack of inflation protection in pension plans is that people already have enough inflation insurance. Most notably, Social Security retirement benefits are indexed to wages during the preretirement years and to the CPI after retirement. Furthermore, much personal saving takes the form of investment in residential real estate, which while not riskless, is probably hedged against inflation risk (Feldstein 1983; Summers 1983).

Finally, money illusion must be considered. In economies where the rate of inflation is not too high, people mistakenly treat nominal values as if they were real. Even professional financial planners often fall into the trap of treating nominal annuities as if they were real, for retirement planning purposes.

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[2] For an alternative view that sees the projected benefit obligation as at least as appropriate a measure, see Black (1989), Arnott and Bernstein (1988), and Ambachtsheer (1987). Bodie (1990c) discusses the issue at length and concludes that the approach adopted by FASB is correct.

[3] This explanation, however, raises the question of why integrated defined benefit plans insure against Social Security risk even though they have no apparent way of hedging that risk through an appropriate investment strategy.

[4] These innovations will be discussed in some detail later in this paper.

Many financial planners and benefits specialists use the following rule of thumb to judge the adequacy of retirement income: add expected Social Security benefits and expected pension benefits and divide their sum by preretirement income. If this so-called "replacement ratio" is greater than 0.8 (or 80 percent), the individual will have adequate retirement income and does not need to supplement it with other retirement saving.

This approach ignores the effect of post-retirement inflation on pension benefits and therefore can lead to inadequate saving for retirement (Bodie 1990b). For example, imagine a 45-year-old who works for a firm that has a defined benefit pension plan offering a benefit equal to 1.5 percent of final pay times the number of years of service. His salary is now $50,000 per year, and he does not expect it to grow in real terms.

By the time he retires he will have worked for the company 40 years, and his pension benefit will therefore be 60 percent of his final salary or $30,000 per year. He expects Social Security to provide a benefit of $10,000 per year, so his expected combined retirement income is $40,000 and his replacement ratio 80 percent.

Now suppose that after retirement inflation is 5 percent per year. At that rate prices double roughly every fourteen years. His Social Security benefit has a COLA (cost-of-living adjustment), so it will increase in tandem with inflation. But his pension benefit does not. The $30,000 of pension income, which may have been adequate when he retired, will have one-half of its original purchasing power when he is halfway through retirement.

Most retirement planning professionals currently pay little more than lip service to post-retirement inflation in calculations of income replacement ratios. This replacement ratio fallacy may lead employees to mistakenly think that a defined benefit plan with a final average pay formula offers them more inflation protection than it really does. What incentive does an employer have to incur the costs of offering inflation protection to employees who are already behaving as though they had it? By raising the issue, the employer might alert the employees to a previously unnoticed inadequacy in their benefits package and cause discontent.

The Corporate Pension Guarantee and Funding and Investment Strategies

If a corporate pension fund has an accumulated benefit obligation that exceeds the market value of its assets, FASB Statement 87 (FASB 87) requires that the corporate sponsor recognize the unfunded liability on

its corporate balance sheet. If, however, the pension assets exceed the accumulated benefit obligation, the corporate sponsor cannot include the surplus on its balance sheet.

This asymmetric accounting treatment expresses a widely held view among pension professionals that as guarantor of the accumulated pension benefits, the sponsoring corporation is liable for pension asset shortfalls but does not have a clear right to the entire surplus in case of pension overfunding. Recent court rulings in cases of terminations of overfunded plans have left unclear how much of the surplus belongs to the plan sponsor, but it is clearly less than 100 percent.[5]

The asymmetry between the treatment of pension deficits and surpluses creates an incentive for pension plan sponsors to pursue an investment policy of immunizing their pension liabilities.[6] If the firm's shareholders own less than 100 percent of the pension fund net worth, then any increase in the riskiness of the pension assets will reduce the market value of shareholders' equity.

The corporate guarantee of the accumulated benefit obligation is in effect a put option on the investments of the pension fund with an exercise price equal to the present value of the accumulated benefit obligation. The pension fund net worth is analogous to a call option. A well-known result in the theory of option pricing is that if the volatility of the underlying security's price increases, then the put and the corresponding call option will both increase in value by the same amount (Bodie, Kane, and Marcus 1989, p. 564). In the case of a defined benefit pension fund, if the values of both the corporate pension guarantee (a liability of the corporation) and the pension fund net worth (only partially a corporate asset) increase by the same amount, the value of corporate equity must go down.

Immunization and Duration Matching

One way to minimize this cost to the corporation's shareholders is to immunize the pension liability through an investment strategy of duration matching. For example, suppose we can characterize the firm's pension liability as a perpetual annuity. Suppose further that the term structure of interest rates is flat.

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[5] Early papers on pension finance by Sharpe (1976) and Treynor (1977) assumed that the pension trust was essentially an asset of the sponsoring corporation. Bulow and Scholes (1983), however, argue convincingly that the corporation's shareholders and the plan beneficiaries actually share ownership. The only way that the corporation's shareholders can get the entire pension fund surplus is by reducing the level of funding in the future. Thus while the corporation may own less than 100 percent of the pension fund surplus in the short run, in the long run it can take it all.

[6] See Bodie (1990c) for a more complete explanation.

The duration of this liability is (1+y)/y years, where y is the level of interest rates. By investing in a bond or other fixed-income securities with this same duration, the corporation can ensure that the value of its pension assets will always equal the value of the pension liability. A simple way to do this would be to invest in zero coupon bonds with a maturity of (1+y)/y years. As y changes and as the bonds in the pension fund portfolio mature, management has to continuously readjust the portfolio to maintain a duration equal to (1+y)/y.

The pursuit of duration-matching strategies by pension funds has created a demand for fixed-income instruments with a guaranteed duration. Such innovations of the past ten years as zero coupon bonds, collateralized mortgage obligations, interest rate swaps, and interest rate futures contracts can be viewed, at least in part, as the market response to this demand. They are all ways of eliminating duration uncertainty from traditional bonds and mortgages.

Pension Overfunding and Contingent Immunization

If the corporation's management wants to maximize shareholder wealth, why should it choose to fund the pension plan and why should it invest in anything but securities that exactly hedge the accumulated benefit obligation liability? There are at least four reasons why firms fund their defined benefit pension plans.

First, minimum standards are imposed by law. The purpose of these standards is to insure the promised pension benefits against the risk of default by the corporate sponsor and to protect the government (and therefore the taxpayer) from abuse of the insurance provided by the government. Recent changes in the law have made the insurance premium charged by the Pension Benefit Guaranty Corporation (PBGC) a function of the degree of underfunding and have eliminated the possibility of voluntary termination of an underfunded pension plan (Utgoff 1988).

Second, plan sponsors have big tax incentives to fund their defined benefit plans. Black (1980) and Tepper (1981) have shown that the tax advantage derived from a defined benefit pension plan stems from the ability of the sponsor to earn the pretax interest rate on pension investments. In order to maximize the value of this tax shelter, it is therefore necessary to invest entirely in assets offering the highest pretax interest rate. Because under the U.S. tax code dividends from investments in common and preferred stock are taxed at a much lower rate than interest on bonds, corporate pension funds should invest entirely in taxable bonds and other fixed-income investments. Recent changes in the tax laws have reduced the ability of pension plans to overfund, but sponsors are still allowed to make additional tax-qualified

contributions as long as pension assets are less than 150 percent of the accumulated benefit obligation.[7]

Third, funding its pension plan provides the sponsoring corporation with financial "slack" that can be used in case of possible financial difficulties the firm may face in the future.[8] Because the law still allows plan sponsors facing financial distress to draw upon excess pension assets by reduced funding or, in the extreme case, voluntary plan termination, the pension fund can effectively serve as a tax-sheltered contingency fund for the corporation.

Finally, PBGC insurance covers only a portion of the promised benefits for the highly compensated plan participants. Funding provides a cushion of safety for this group, which includes top corporate management.[9]

If the pension fund is overfunded, then a 100 percent fixed-income portfolio is no longer required to minimize the cost of the corporate pension guarantee. Management can invest surplus pension assets in equities, provided it reduces the proportion so invested when the market value of pension assets comes close to the value of the accumulated benefit obligation. Such an investment strategy is known as portfolio insurance or contingent immunization.

The pursuit by pension funds of portfolio insurance strategies has created a market for index options and futures contracts. The implementation of these strategies is feasible without these derivative securities, but their existence makes implementation less costly and less disruptive to the activities of portfolio managers.[10]

Pension Fund Investment Policy in Practice

How do corporate pension funds actually invest their money? No significant difference in the overall asset mix is found between defined benefit and defined contribution plans. Regardless of plan type, corporate pension funds tend to invest between 40 and 60 percent of assets in equities and the remainder in fixed income securities (Greenwich Research Associates 1988).

If the only goal guiding corporate pension policy is shareholder wealth maximization, then it is hard to understand why the pension

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[7] The relevant law is the Omnibus Budget Reconciliation Act of 1987 (OBRA).

[8] See Bodie et al. (1987) for a more complete discussion of the financial slack motive for funding a pension plan.

[9] See Light and Perold (1987) for a more complete discussion of this point.

[10] Leland and Rubinstein (1988) have described how the emergence of a market for stock index futures made their ideas for portfolio insurance commercially viable.

fund would invest in equities at all. A policy of 100 percent bonds would both maximize the tax advantage of funding the pension plan and minimize the cost of guaranteeing the defined benefits.

This suggests that corporate management views the pension plan as a trust for the employees and manages fund assets as if the pension plan were a defined contribution plan with a guaranteed floor specified by the benefit formula.[11] In doing so, it balances the goal of shareholder wealth maximization against the goal of employee welfare maximization.

One possible approach consistent with this underlying assumption is to manage the assets so as to maximize employee welfare subject to the constraint that the cost of providing the benefit guarantee is minimal. Such a policy could lead an overfunded pension plan to invest in equities. But it would also dictate that a firm should reduce the proportion of its portfolio invested in equities if the degree of overfunding falls. In other words, it should pursue a policy of portfolio insurance or contingent immunization.

Recent trends in pension asset allocation are broadly consistent with this explanation. Some pension funds pursue portfolio insurance strategies openly, often using stock index futures. Others accomplish a similar result through stop-loss orders and similar trading techniques in the stocks themselves.

The widespread practice of writing covered call options can also be interpreted as evidence that pension funds want to convert some of their investment in corporate equities into debt. By writing a call option on an appropriate stock market index, a pension fund can effectively transform a portfolio of stocks into a portfolio of corporate bonds maturing at the expiration date of the option.[12]

Berkowitz, Logue and Associates (1986) found that the average risk-adjusted performance of ERISA plans from 1968 to 1983 was lower than returns experienced by other diversified portfolios in U.S. financial markets. This could be interpreted as evidence that pension funds pursue contingent immunization strategies. Under this interpretation, the difference in their average return is in effect the insurance premium. Berkowitz and Logue also found that more reallocation between stocks, bonds and cash equivalents occurred in defined benefit pension plans than in the control group. This too can be interpreted as evidence of portfolio insurance practices.

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[11] For other possible explanations of pension fund investment in equities see Bodie (1990c).

[12] See the appendix for a more complete explanation of how this transformation is accomplished.

In cross-sectional studies of pension asset allocation, we would expect to find that the proportion of fund assets invested in equities would be positively related to plan overfunding. Friedman (1983) found no significant correlation between the allocation of defined benefit plan assets and the funding status of the plan. Bodie et al. (1987) confirmed this finding. In both of these studies, however, the unit of observation was the corporation rather than individual plans. Since many corporations have several plans, some of which are overfunded (usually the ones for salaried employees) and some underfunded, it could be that the effect we are looking for is obscured at the level of the firm.

Recent changes in accounting rules and tax law are likely to reinforce the strategy of immunization. As a result of FASB 87, corporate officers concerned with the adverse impact of an unfunded accumulated benefit obligation on the corporate balance sheet will have a greater incentive than before to hedge against interest rate risk.

Two provisions of the Omnibus Budget Reconciliation Act of 1987 (OBRA) are relevant. The first is the strengthening of the claim of the PBGC on corporate assets for underfunded pension plans. This will eliminate some of the incentive for such corporations to take risks with the assets in the pension plan and therefore will increase the proportion invested in fixed-income securities.

The second relevant provision of OBRA is the imposition of strict funding limits on pension plans. If pension plans gradually become less overfunded, the cost of providing benefit guarantees will become more sensitive to the proportion invested in equities. The plans will therefore have an incentive to invest more in fixed-income securities.

Financial Innovation as a Response to the Investment Demands of Pension Funds

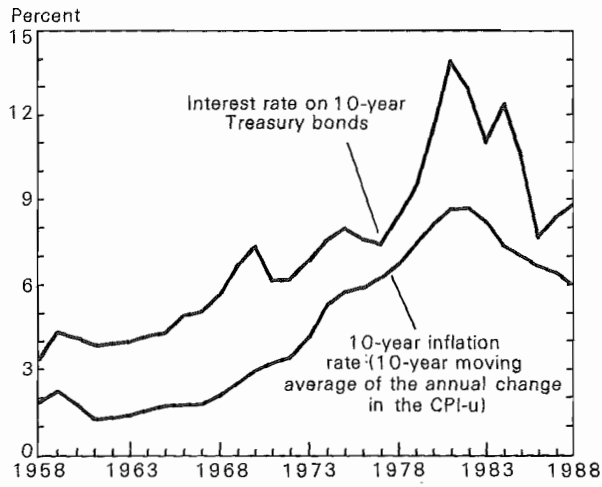
Most of the innovations in the fixed income securities markets since the early 1970s have been in response to an underlying increase in the level and volatility of interest rates and the desire to hedge against the risks created thereby. These interest rate developments were triggered largely by the inflationary trend that began in the late 1960s.

Figure 1 shows the history of a 10-year moving average of the inflation rate and the interest rate on 10-year Treasury bonds, from 1958 to 1988. If we interpret the moving average of past inflation rates as a proxy for the expected rate of inflation, we can explain the trend in long-term interest rates almost entirely on the basis of the trend in expected inflation.

The initial response to the high and unpredictable interest rates of the early 1970s was the emergence of an active market for floating-rate

Figure 1

Inflation and Interest Rates



Source: The 10-year Treasury bond interest rate - *Economic Report of the President 1989*, Table B-71. The rate of inflation - U.S. Bureau of Labor Statistics.

debt, as both borrowers and lenders shied away from long-term commitments at fixed rates. Smith and Taggart (1989) point to Citicorp's $850 million issue in 1974 as the key development in this area. Many bond market analysts were predicting a permanent shortening of the maturity structure of fixed-rate debt and a complete transition to floating-rate corporate debt and adjustable-rate mortgages. The last thing they imagined was a surge in the exact opposite direction.

But then came ERISA. In 1974 Congress passed the Employee Retirement Income Security Act and in one bold stroke transformed the structure of institutional demand for fixed-income securities. The critical features of ERISA for the capital markets were its codification of the legal status of corporate defined benefit pension obligations and its imposition of minimum funding requirements. The new age of bond immunization and duration matching began.

The demand for long-duration, fixed-income securities was not

new. Life insurance companies always had an investment demand for long-term, fixed-income securities to hedge their whole-life and annuity products. But consumer demand for these products went into eclipse in the 1970s because of the inflationary bulge and resulting high interest rates. Sales of new policies fell sharply, and loans to policyholders at contractual interest rates as low as 4 percent per year were siphoning funds away at a pace that alarmed insurance executives.

Eventually, the environment of inflation and interest rate uncertainty of the 1970s led the insurance industry to innovate in the retail market of the 1980s. They designed universal life and variable life insurance policies, offering interest rates that were both higher and more adjustable than those embodied in traditional whole-life policies. Joining forces with mutual funds, the life insurance industry also started offering insured savings plans that allowed a broader spectrum of investment instruments, including money market funds and common stocks. Thus retail demand in the insurance market has led to a shortening of the maturity structure of life insurance company investments.

The new demand for long-duration, fixed-income securities has come primarily from pension funds. Life insurance companies have played an important role in this market both by directly assuming pension fund liabilities and by providing guaranteed investment contracts (GICs) to pension funds. GICs are essentially zero coupon bonds issued by insurance companies, which hedge the liability by investing in fixed-income securities. Insurance companies thus have become an additional layer of financial intermediation. Their demand for long-duration debt is ultimately derived from the demand by pension funds.

While the immunization strategies of pension funds have spurred innovation in the fixed-income securities markets, pension fund contingent immunization and portfolio insurance strategies have created a market for index options and futures contracts. The implementation of these strategies is feasible without these derivative securities, but their existence makes implementation less costly and less disruptive to the activities of portfolio managers.

Pension fund involvement in writing covered call options has also been an important factor contributing to the growth of stock options markets. As explained before, buying stocks and writing call options on them is similar to investing in fixed-income securities. Pension funds that write call options on stocks or stock indexes are in effect converting some of their investment in equities into short-term fixed-income investments.

Future Innovations

As people rely more and more on pensions and private savings to provide their retirement income, demand for suitable financial products will surely increase. The existing array of life annuities offered by life insurance companies and pension plans has one major shortcoming: the lack of protection against inflation (Bodie 1989b and 1990b).

Until recently investors had no simple way to completely hedge inflation risk in the U.S. capital market (Bodie 1990a). Recently, however, several financial institutions have issued securities linked to the U.S. consumer price level. The new securities were issued first by the Franklin Savings Association of Ottawa, Kansas, in January 1988 in two different forms.

The first is certificates of deposit, called Inflation-Plus CDs, insured by the Federal Savings and Loan Insurance Corporation (FSLIC) and paying an interest rate tied to the Consumer Price Index (CPI). Interest is paid monthly and is equal to a stated real rate plus the proportional increase in the CPI during the previous month.

The second form is twenty-year noncallable collateralized bonds, called Real Yield Securities or REALs. These offer a floating coupon rate equal to a stated real rate plus the previous year's proportional change in the CPI, adjusted and payable quarterly.

Two other financial institutions have recently followed the lead of Franklin Savings.[13] If the trend continues, we will have reached a milestone in the history of this country's financial markets. For years prominent economists at all points of the ideological spectrum have argued that the U.S. Treasury should issue such securities, and scholars have speculated why private markets for them have not hitherto developed.[14] The current innovative environment in the U.S. financial markets appears to finally have put an end to this speculation by producing private indexed bonds in several forms.

From the perspective of this paper, what is interesting about these developments is that savings institutions have undertaken to offer this insurance against inflation risk without having a way of completely hedging that risk through their investment policy. The owners of these institutions are bearing the inflation risk through their own capital.

This is a viable situation for small amounts of inflation insurance.

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[13] In August 1988, Anchor Savings Bank became the second U.S. institution to issue REALs, and in September 1988, JHM Acceptance Corporation issued modified index-linked bonds subject to a nominal interest rate cap of 14 percent per annum. The investment banking firm of Morgan Stanley & Co. Incorporated is the underwriter and market maker for REALs.

[14] See, for example, the analysis in Fischer (1986).

Should the demand grow, however, it seems clear that the additional supply of price-indexed securities would have to come from the nonfinancial sector.

One promising source of CPI-linked investments for an inflation insurance intermediary is CPI-linked home mortgages. The U.S. Department of Housing and Urban Development (HUD) is about to certify a variety of price-level-adjusted mortgages (PLAMs) for Federal Housing Administration (FHA) approval. Once FHA mortgage insurance is available and the tax status of PLAMs is clarified, they could account for a significant portion of new lending in the home mortgage market.[15]

Nonfinancial businesses have shown some willingness to issue debt securities that are indexed to the prices of their output. A financial intermediary could pool such bonds in order to synthesize an investment that hedges annuities indexed to broader price measures (Blinder 1976).

With a large market for price-indexed securities and their derivatives, pension plan sponsors and other financial institutions could then offer annuities with inflation insurance features. Sponsors who already offer their employees several investment options for their supplementary savings plans can simply expand the set of alternatives to include CPI-linked securities.

Merton (1983) has proposed a more radical innovation. Instead of indexing retirement annuities to the cost of living, he suggests indexing them to aggregate per capita consumption. His proposal is based on a model of lifetime household optimizing behavior that suggests that such consumption-indexed annuities might enhance welfare considerably. Merton envisions a major role for the government in making this type of product possible. In view of the innovative atmosphere in the U.S. financial markets in recent years, however, it is conceivable that the private sector can manage it without help from the government.

Summary and Conclusions

Pension funds have played a critical role in the evolution of the markets for debt and equity securities and their derivatives in the United States over the past fifteen years. Defined benefit pension plans offer annuities that have a guaranteed floor specified by the benefit formula. In order to minimize the cost to the sponsor of providing this guarantee, a strong incentive exists to invest an amount equal to the present value

[15] See Modigliani and Lessard (1975) for discussions of these mortgage designs.

of the accumulated benefit obligation in fixed-income securities with a matching duration.

The increased volatility of interest rates and the tightening of government regulations in the past fifteen years have made it important for pension funds to find efficient ways to hedge their liabilities. The result has been rapid growth in the use of immunization and contingent immunization strategies.

Many of the innovations in the U.S. financial markets during this period can be interpreted as responses to the hedging demands of pension funds. Some examples are the emergence of the markets for zero coupon bonds, guaranteed investment contracts, collateralized mortgage obligations, options, and financial futures contracts. A useful way to predict financial innovations is to forecast the future hedging demands of pension funds and other institutions catering to the retirement income needs of our aging population.

Most of the innovations noted in this paper were not the creations of the corporations issuing the primary debt and equity securities. Instead, they were created by financial intermediaries, which transformed these primary securities into the types of claims that pension funds wanted to hold. This points out an important fact: the portfolio demands of lenders do not necessarily determine the type of securities issued by the ultimate borrowers.

Appendix: Using Derivative Securities to Convert Equity into Debt.

The purpose of this appendix is to show how derivative securities such as forward contracts and options can be used to convert a portfolio of common stocks into a bond. To keep the exposition simple, we will assume the portfolio is a single stock that pays no dividends, and we will assume that options on the stock are of the European type and therefore can only be exercised at expiration.

Suppose you are holding a share of XYZ stock with a current price of S. Now consider a forward contract on the stock with a forward price of X payable T years from now. Because the contract commits you to hand over the stock T years from now in exchange for X dollars, you can convert the stock into a zero coupon bond maturing in T years by selling such a forward contract. In other words, a combination of the stock plus a short position in the forward contract is equivalent to a zero coupon bond.

Instead of selling a forward contract, suppose you sell a call option with an exercise price of X. The call option is similar to the forward contract in that if T years from now the stock price exceeds X, you will have to hand over the stock in exchange for X dollars. The call option differs from the forward contract in that if at the expiration date the stock price is less than X, the option will not be exercised and you will be left with the stock.

The combination of the XYZ stock and a short position in the call option is therefore similar to a zero coupon XYZ bond with default risk. The analogy with default risk is that if XYZ Corporation were to default on its debt, then its unsecured bondholders would become stockholders. If the exercise price, X, is far below the current stock price, S, then the call option is very likely to be exercised. In our analogy, this would correspond to the default risk on the bond being very low.

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Discussion

*Peter L. Bernstein**

Zvi Bodie's paper asserts that the major financial innovation of the 1980s has been the development of new securities and markets designed to provide long-duration, fixed-income cash flows. He traces the origin of these innovations to the high level and unprecedented volatility of interest rates and the demand for instruments that would hedge against "the risks created thereby." Bodie then goes on to argue at length that defined benefit pension plans have been the major source of demand for these new securities, because of the need of pension funds for immunization strategies to secure the nominal benefits they have promised to their employees.

My comments on Bodie's paper will cover three topics. I begin with a brief comment on Bodie's omission of other large players in this area that were just as important as pension funds; he may also be exaggerating the role of FASB 87 as a motivator for the pension funds, at least in the early years of the decade. Second, by focusing on the long-duration innovations, Bodie's paper makes little distinction between government and corporate issues, but it is the corporate side that concerns us here. Finally and perhaps most important, in studying the capital markets from the standpoint of the lender, we must put the whole question into a setting that is wider than the world of pension funds alone.

Expansion of the Long-Term Bond Market

Pension funds were not the only buyers of long-duration, fixed-income securities, and immunization of liabilities was not the only

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investor motivation. Bodie's paper provides one answer to the question of why lenders are more willing to provide more debt than in the past. Nevertheless, although Bodie is on solid ground in placing emphasis on FASB 87, the explosion in the demand for fixed-income securities, and in particular, for long-duration, fixed-income securities, preceded FASB 87 by five years at least. FASB 87 did make investment people wake up at long last to the reality that assets exist to fund liabilities, not simply to earn some rate of return, but that belated awakening was by no means the only force that drove investors into the long-term bond market with such enthusiasm.

Rather, the degree to which record-high nominal long-term interest rates lagged the decline in inflation after 1981 made long-duration instruments an almost irresistible asset for any investor, regardless of that investor's liability structure. It could hardly have been just the demands of pension funds seeking immunization of their liabilities that drove total returns in the long-term bond market to 27 percent a year from the end of 1981 to the beginning of 1986, during which time FASB 87 was still only a topic of discussion and the volume of open market borrowing was enormous by any standard of measurement. Nor would indexing portfolios to the major bond market indexes have become such a popular strategy if immunization had been the primary objective of fixed-income investors.

Furthermore, in addition to the demand for bonds in general, the demand for long-duration instruments was not limited to pension funds. Practitioners in the bond market had learned well that central lesson of Homer and Leibowitz's popular *Inside the Yield Book* (1972): an uncertain reinvestment rate is a major risk for all buyers of bonds. Very simply, there was genuine urgency to lock in those almost unbelievable real rates while they lasted and to take advantage of every volatility-hedging technique that was available as well. Spurred on by returns as good as or occasionally better than in the stock market, individual investors kept right up with the institutions in going for the zeros and the futures and, in the process, poured billions into the bond mutual funds.

In short, it is hard to believe that these innovations would not have played an important role in financial markets even if pension funds had not found these instruments so accommodative to their needs.

A Closer Look at the Market for Corporate Bonds

The more interesting question is what all of this had to do with the rise in the debt-equity ratio that is the focus of this conference. Most of the long-duration instruments that attracted the pension funds were

governments, government derivatives like Treasury futures, or other high-quality, liquid issues. Immunization and cash-flow matching are tricky enough without adding basis risk and poor marketability to the equation.

In the corporate bond market, on the other hand, where long-term instruments are usually callable and where quality has continuously deteriorated during the 1980s, the character of the environment has been fundamentally different from the market for public securities. Indeed, as a result of rising yields and little change in call protection, the pattern in the corporate market has been for durations to shorten rather than lengthen. This process applies to all corporate bonds, but it has been most visible in the rapidly growing junk bond market. Here, the combination of lower average maturities, extra-high current yields, and short call features have tended to create durations that are significantly shorter than durations in the more slowly growing high-quality corporate market.[1] The additions of a varied and exotic set of equity kickers to some of the junk bond issues, and an occasional junk bond in zero-coupon form or with deferred coupons, represent efforts to satisfy the demand for longer durations, but these quasi-bonds are hardly comparable to the type of fixed-dollar obligations that Bodie's paper is discussing.

Within the context of this conference, the pertinent question is: Why were Michael Milken and his cohorts able to find the mother lode with such a high level of success? Why, in the light of the many intense financial crises that the American economy had been through since 1969, were investors so eager to lend money on promises that were significantly less secure than they had been in the past?

Only part of the answer to this question resides in the discussion up to this point: the sheer beauty of the promised real return. The rest of the answer, in my judgment, is precisely in the attraction of blurring the distinctions between debt and equity.

At the dawn of the 1980s, equity investors had a most unhappy bank of memories. From the end of 1965 to the middle of 1982, the annual compound total return on the S&P 500 was a piddling 5.2 percent a year, while inflation raged at 7 percent and Treasury bills also returned 7 percent. Lower-grade corporate bonds, on the other hand, appeared to offer highly competitive returns or perhaps better, with significantly less volatility than equities and, despite their low quality, a claim on corporate assets that was still senior to the position of equity.

The theory of contingent claims teaches us that a corporate bond

[1] Few junk bond issues have maturities beyond twenty years, and many eight- to ten-year maturity issues have only three-year call protection. See Ross et al. (1989), p. 2.

can be priced as a call option on the company's assets sold by the lenders to the shareholders. This option will have a strike price equal to the amount of the loan and a premium equal to the difference between the riskless rate of interest and the going rate for loans of this type.

The shareholders can exercise the option by paying off the loan, which they will do when their option is "in-the-money"—that is, if the company's assets comfortably exceed the claim of the lenders. If the shareholders default, they let their option expire by leaving the assets in the possession of the lenders. The value of that option will be a direct function of the volatility of the underlying claim—namely, the structure of the debt-equity ratio itself and the volatility of the underlying business.

In view of their unhappy experiences in the stock market over a period of some fifteen years, many investors found selling the volatility to others an attractive proposition, especially when the premium compared so favorably to what they had been earning on the other side of the deal—and when, in addition, the volatility of the instrument itself seemed to be significantly lower than the volatility of even the highest-rated bonds. The ratios of equities to total assets in institutional portfolios, as a result, have remained at levels well below the record high levels of the late 1960s.[2]

Investors themselves have been making clear the distinction between this kind of investment strategy and the search by pension funds for long-duration assets as described in Bodie's paper. Institutional investors are increasingly treating their lower-quality bond positions as an asset class separated from their conventional bond portfolio—an asset class with high expected returns but little covariance with longer-duration nominal liabilities.

Further substantiation of this view may be found in a recent Salomon Brothers document by Ross, Chacko, Palermo, and Warlick (1989). This paper provides clear statistical evidence that high-yield bonds have different risk profiles and less return volatility than conventional bonds, as well as low correlations with all other asset classes. A correlation of monthly returns from January 1985 to December 1988 shows an average correlation coefficient of only a little over 0.50 between high-yield bonds and Treasuries or high-grade corporates, although coefficients among these conventional bond market groupings run over 0.90. On the other hand, the high-yield sector's correlation with the

[2] These quasi-equity securities also found a ready market among investors who wanted the higher expected returns from equity exposure but were denied it by regulatory restrictions. This group includes the S&Ls, about which no elaboration is necessary.

S&P 500 was 0.63, well above the correlation with the other segments of the bond market.

How Much Bang for the Buck?

As an economist as well as an investor, I am concerned by the nagging question of what the economy as a whole is getting out of all of this. The negatives may well outweigh the positives: Friedman (1989), for example, has argued strongly that our economy now has a new externality in the form of enhanced corporate risk, as a result of the dramatic deterioration in the debt-equity ratio and the gradual conversion of pure debt into quasi-equity. The equally important issue is what these micro developments mean for macro rates of return.

If the debt-equity ratio gives us some measure of the changes in risk, the debt-income ratio is more revealing for purposes of analyzing expected returns. And here the readings are not at all encouraging. The ratio of nonfinancial corporate debt to nonfinancial corporate gross domestic product rose from 52 percent in 1982 to over 67 percent by the end of 1988—a gain of 15 percentage points in just six years. Economists traditionally consider debt creation stimulating and often blame it for inflationary pressures, but the upward jump in the debt-GDP ratio tells us that their traditional expectation in this instance was far wide of the mark.

In fact, little indication can be found that all this borrowing was for the purpose of financing the real growth of these corporations. The ratio of business fixed investment and inventory accumulation to corporate cash flow in this expansion has been no higher than average, so that normal business needs for external finance have not been unusually large. Rather, as we all know only too well, borrowers have used a major proportion of the proceeds of new debt to purchase either their own equity shares or the shares of other corporations. This means that the borrowing went mostly to pay for existing assets rather than for the creation of new assets.

But growth is important for lenders as well as for holders of equity, and increasingly so as the process blurs the distinction between the two. New earning assets in the business and new sources of revenue growth help to secure the position of lenders at the same time that they benefit the shareholders. Shuffling of pieces of paper, with the consequent shift in the liability structure of the corporation, may do positive things for management motivations and other aspects of the agency problem, but better management must improve corporate performance by a whole lot under these circumstances just to keep risk constant.

Hence, the issue is not really how the money is raised, but, rather,

what is done with the money after it is raised. This is the ultimate lesson of Modigliani-Miller's famous Proposition I (1958), which declares that the value of the corporation is independent of its debt-equity ratio but is dependent on the expected stream of earning power.

Looking from this perspective, it is appropriate to ask whether the pressure for financial innovations is overwhelming the introduction of technological innovations. In other words, are the increasing risks in the corporate financial structure blunting management's appetite for taking the business risks with slow payoffs that are essential if we are to sustain dynamic rates of real growth?

The import of these questions explains why it is my position that the target of our concerns should be the ballooning debt-income ratios, not the debt-asset or debt-equity ratios. When we finally return to borrowing to finance growth rather than to shuffle the pieces of paper, we will be on our way to a better future.

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Discussion

*Benjamin M. Friedman**

The subject of this conference is the extraordinary wave of mergers, acquisitions, leveraged buyouts and stock repurchases that has swept over so much of corporate America within the past half-decade. Although the broad outlines of this phenomenon are by now fairly well known, two aspects of what has happened do bear specific mention. First, U.S. business corporations have borrowed in record volume, and as a result the outstanding corporate debt is now greater in relation to gross national product than at any time since World War II. In 1980 there was 29 cents of corporate debt outstanding for every dollar of U.S. GNP. Today the level is 38 cents on the dollar. The all-time peak was just 45 cents on the dollar, in 1928. Hence the increase in this debt ratio just between 1980 and 1989 has already covered half the distance between the 1980 level and the record debt load just before the Great Depression.

The second especially important feature of this wave of debt issuance is that, by and large, firms have not borrowed these funds to invest in new earning assets. Instead, corporations have borrowed primarily in order to pay down their own equity and the equity of other companies. The volume of equity paid down by U.S. nonfinancial business corporations during the five years 1984 to 1988, measured in excess of the proceeds of new shares issued during this period, was $444 billion. In the first half of 1989, nonfinancial corporations paid down equity at the even faster rate of $143 billion per year.

The greatest puzzle surrounding these events is why all this is happening just now. To be sure, firms may want to take on debt for

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many reasons. But the question is why the incentives to do so have become so much greater in the 1980s. As Alan Auerbach's paper in this volume shows, it is not because tax incentives, or incentives associated with inflation, have become greater. If anything, both of these have dulled since 1980.

At first thought, Zvi Bodie's paper appears to provide an answer to this puzzle. In particular, the answer suggested by this paper is that the issuers of corporate securities issue what the buyers want to buy, and that identifiable changes affecting the buyers of corporate securities, including especially private pensions, have altered their portfolio preferences in the direction of wanting more debt rather than equity.

I am very sympathetic to Bodie's fundamental assumption that financial intermediation can, and does, importantly affect the asset demands that the ultimate issuers of securities face. Moreover, Bodie's paper does an excellent job of identifying reasons (reasons that, importantly, are external to the relevant intermediaries themselves) why pensions' asset demands have, or at least ought to have, changed within the past decade. Bodie points in particular to tax changes, FASB rulings and, of course, the 1974 ERISA legislation. All this is both interesting and well argued.

In the end, however, Bodie's paper does not explain why the corporate reorganization wave is happening in the 1980s, nor does it answer the more limited question of why lenders have been willing to absorb such large volumes of debt securities bearing risk properties that make them more like equities. Bodie identifies as the primary driving force behind these events the increasing desire on the part of lenders (again, specifically pensions) to hedge their long-term nominal liabilities against risk due to volatile interest rates—that is, to "immunize" these liabilities. The result, as he convincingly demonstrates, is an increasing demand for long-term nominal assets. But all this might just as well, or perhaps even more appropriately, be a story about the demand for U.S. government securities or for derivative products based on U.S. government securities, rather than something having to do with corporate debt. Indeed, high risk of default, or of having to reschedule payments, should have made corporate debt *less* attractive from the perspective of the increasing desire for liability immunization on which Bodie's paper focuses. The analysis in Bodie's paper therefore does not explain why lenders have been willing to take on ever greater amounts of corporate debt securities with risk properties resembling equities. (Bodie does note in passing that *overfunded* pensions would logically have a demand for equity, and therefore for equity-like debt, but he acknowledges that neither his work nor that of other researchers has managed to turn up any evidence that, in practice, overfunded pensions actually tend to invest disproportionately in equities.)

One further aspect of Bodie's discussion of pensions merits specific comment in this regard. At the outset of the paper, he notes parenthetically that most of his analysis of private pension funds ought also to apply to state and local government retirement funds. On just the issue that is the focus of this conference, however, these two kinds of pension funds have behaved very differently in the 1980s. Private pension funds have been net *sellers* of equity securities in every year since 1985. In the first half of 1989, for example, private pension funds were net sellers of equity at a rate of $10 billion per annum. This switch away from equity is the heart of Bodie's story. By contrast, state and local government retirement funds have been large net *buyers* of equities throughout this period. On average during the years 1985 to 1988, state and local government pension plans were equity buyers at the rate of $26 billion per annum. In the first half of 1989, state-local government pensions bought equities at a $24 billion per annum rate.

Finally, pension funds—even including both those sponsored by corporations and those sponsored by state and local governments—are not the only category of lender that is relevant to the subject of this conference. Especially in the context of this conference's sponsorship by a Federal Reserve Bank, it is also important to address the role of the banks.

Commercial bank assets in the United States are now substantially in excess of $3 trillion. Further, this $3 trillion-plus of bank assets is very highly concentrated. Over $1 trillion of the total is at the nation's largest fifteen banks. And ironically, just as these top fifteen banks have been reducing their exposure to the problem debts of developing countries, they have been sharply increasing their exposure to debts issued in the course of leveraged buyouts and other high-leverage corporate reorganizations. It almost appears as if these banks have a competitive need for high-risk assets, and since they are finally getting out of one high-risk asset, competitive pressures are driving them into another. According to a recent survey based on the annual reports that banks released in 1988, the top fifteen banks in the United States had a combined total of $37 billion of leveraged buyout exposure. That amount exceeded these banks' entire risk-adjusted capital, even with all of their LDC debts at that time taken at par value. Banks are clearly getting ever more heavily into the high-leverage corporate debt business.

The question that therefore arises is whether, in the same way that we stood by for years as savings and loan associations turned into federally insured real estate funds, we may now be about to watch our commercial banks become federally insured equity funds. If so, then regardless of how our bankers view this development, our central bankers should view it with serious concern.

To recall, the important point about business borrowing in the 1980s

is that the purpose of this borrowing has not been to put in place new assets, but to substitute debt for equity. As a result, the ratio of corporate interest payments to corporate earnings (measured before interest and taxes) has risen to an extraordinary level. On average in the 1950s and 1960s, 16 cents out of every dollar of corporate earnings went to pay the interest bill. In the 1970s, when earnings growth suffered while inflation raised nominal interest rates, the interest burden rose to 33 cents on the dollar. On average in the 1980s, it has taken 56 cents of every dollar of corporate earnings just to pay corporations' interest bills. Despite the fact that nominal interest rates have fallen sharply and the United States has enjoyed seven years of sustained economic expansion with strong growth in earnings, interest payments have continued to rise compared to earnings. (Comparable ratios of interest payments to corporate cash flow are lower, of course, but the general trend is the same.) Furthermore, while initially leveraged buyouts occurred mostly in noncyclical industries, so that the risks attendant on a downturn in earnings were lessened, by now the leveraged buyout wave has also moved on to industries with a profoundly volatile character (for example, airlines).

As a result of this substantially increased corporate debt burden, together with the increasing volume of leveraged buyout lending by the country's major banks, it is appropriate to wonder what will happen the next time the United States experiences an episode of tight money. Tight money in this context means two things: high interest rates, and slow (perhaps negative) earnings growth. It is therefore appropriate to ask whether the risk of financial disruption associated with tight money either has already, or will soon, become so great that the Federal Reserve System will not be willing to impose an episode of tight money even if one may be needed to arrest an accelerating inflation. For example, despite the record of three decades (1950 to 1980) in which inflation rose from near-nothing to double-digits primarily because, on average over that time, the Federal Reserve erred on the side of overexpansion, the Director of the U.S. Office of Management and Budget recently criticized the Federal Reserve for, of all things, taking the risk of erring on the side of *under*expansion. Similarly, the most recent Humphrey-Hawkins testimony presented by the Chairman of the Federal Reserve System made clear that, as soon as it appeared that a risk of recession might be present, the Federal Reserve immediately took that risk as ground for easing its monetary policy.

This heightened aversion to recession is probably due, at least in part, to the increased financial fragility that has resulted from the rise in corporate indebtedness which is the subject of this conference. One additional consequence of rising corporate indebtedness may therefore be to complicate—indeed, to threaten and, ultimately, to impair—our

central bank's ability to achieve stable prices. In addition to considering the changing roles of debt and equity from the private lender's perspective, therefore, it is also important to think carefully about how recent changes in debt and equity financing look from the perspective of the nation's lender of last resort.

Tax Policy and Corporate Borrowing

*Alan J. Auerbach**

Aggregate statistics readily indicate why so many observers of financial markets in the United States are concerned about the balance between debt and equity in the corporate financial decision. Exceeding zero in most years before 1984, net equity issues by U.S. nonfinancial corporations have been negative in each year since. Net redemptions averaged approximately $80 billion annually during the period 1984–87, and then rose in 1988 to $131 billion. Over the same period, net new borrowing by the nonfinancial corporate sector rose sharply, with outstanding credit market debt growing annually by nearly $170 billion during 1984–87 and by $189 billion in 1988 (Board of Governors of the Federal Reserve System 1989).

Debt-equity ratios can be calculated in many ways, however, and not every measure provides such a sharp picture of recent events. The change in the value of corporate equity over any period equals net equity issues plus changes in the value of existing equity. Because of the strong performance of the stock market during the 1980s, the ratio of the stock of debt to the stock of equity, measured at market value, began rising only in 1987, the year of the stock market crash.

Although little consensus exists about how debt-equity ratios should be measured to evaluate recent events, the continuing strength

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of corporate borrowing, combined with the historically unusual magnitude of equity redemptions, has led to many theories seeking to explain the new behavior and has evoked calls for tax reform by those attributing the borrowing to flaws in the tax system. This paper considers the theory and evidence relating tax factors to the recent borrowing surge, concluding that changes in tax incentives are not the primary cause of the shift toward debt and that the social costs of increased borrowing may have been overstated. It then reviews a variety of alternative tax reform proposals that have been made over the years to reduce the disparities in the tax treatment of debt and equity. Given the tenuous link between recent borrowing and the tax environment as well as the uncertainty about the social costs of such borrowing, the benefits of these proposals should be clearly established before adoption is considered. Most proposals either would provide significant windfalls at great tax revenue cost or would introduce new distortions to financial behavior.

Taxes and Leverage

The United States has a "classical" corporate income tax, treating corporations and their shareholders as separate entities. The result is the "double taxation" of corporate equity income, with firms paying the corporate tax and shareholders being taxed on dividends and capital gains. With interest a deductible expense, cash flow used to meet corporate interest payments is taxed only once, to the recipient. The distinction of the tax treatment of the corporation from that of an unincorporated business, such as a partnership, is therefore in the treatment of equity, and many reform proposals have been aimed at changing the tax treatment of equity earnings.

Perhaps the easiest way to express the corporate imbalance between debt and equity is in terms of the after-tax return an investor receives per dollar of corporate source income. For equity, the return is $(1-t_c)(1-t_e)$, where t_c is the corporate tax rate and t_e is the investor's tax rate on equity earnings. For debt, the return is $(1-t_b)$, where t_b is the investor's tax rate on interest income.

For a single investor facing equal tax rates on debt and equity income ($t_b = t_e$), debt is clearly the security of choice. Yet, even after the events of recent years, equity remains the dominant form of holding corporate wealth in the United States, and many theories have attempted to explain why.

Taxpayer Clienteles

Two other key features of the income tax are progressivity in the marginal rate structure and a tax advantage for equity at the individual level afforded by the deferral and potentially favorable taxation of capital gains. This causes high-bracket investors to have a tax preference for equity relative to low-bracket investors, and, if the individual tax advantage of equity is high enough, may also cause high-bracket investors to have an absolute tax preference for equity: their tax rate on equity income, t_e, may be far enough below their tax rate on interest income, t_b, that it outweighs the extra burden of the corporate tax.

This sorting of investors by tax rates has been discussed in many contexts in the literature, and is often associated in this particular case with the contribution by Miller (1977). From the perspective of absolute tax preference, the Tax Reform Act of 1986 seems a likely suspect as the source of the recent growth in corporate indebtedness.

As of 1986, the top individual federal tax rate on interest income, t_b, was 50 percent, while the corporate tax rate was 46 percent. Thus, the smart investor who held low-yield stocks and died before realizing capital gains (and hence paid no taxes on them) might actually have faced a lighter total tax burden by holding equity, even with the corporate tax. After the 1986 act, this is no longer possible. The corporate rate, 34 percent, now exceeds the highest marginal tax rate on interest income, 33 percent. Moreover, the maximum tax rate on capital gains has risen from 20 percent to 33 percent, pushing attainment of the "Miller equilibrium" even farther from feasibility. The argument may be put simply: before 1986 there were investors with an absolute tax preference for equity; now there are none. Hence debt has been encouraged.

Diversification and the "Marginal" Investor

A serious problem with this argument is that it presumes that equity is held only by those with an absolute tax preference for it. Yet even zero-bracket investors such as pension funds hold considerable equity in their portfolios. For example, at the end of 1987, private pension funds in the United States held $486.8 billion in corporate equities (including mutual funds) and only $356.2 billion in credit market debt (Board of Governors of the Federal Reserve System 1988a). Clearly, an element of diversification is involved in investor decisions between debt and equity, and this makes every investor a "marginal" investor in the sense that the overall demand for debt versus equity is affected by the tax treatment of each investor currently buying both securities.

Once one recognizes this, the impact of the 1986 tax act becomes far less clear. For some equity investors, such as pension funds, the corporate tax rate is the only tax rate that matters, and the reduction in this tax rate has made equity more attractive. The highest-income investors, who enjoyed a reduction in their marginal tax rate from 50 percent to 28 percent while suffering an increase from 20 percent to 28 percent in the rate of capital gains tax, were almost certainly given a greater incentive to hold debt. Middle-income individuals now in the 33 percent bracket experienced a much lower reduction in their marginal tax rates (which previously had been well below 50 percent), and it is not clear that for them the tax act exerted a strong push toward either equity or debt. Thus, whether the 1986 act encouraged or discouraged borrowing depends on how the demands of each investor group changed. If one looks simply at changes in average marginal tax rates on returns to debt and equity, the calculation suggests that the act actually favored equity.[1]

In a sense, this complication is fortunate if one is attempting to demonstrate that corporate borrowing is tax-driven, since the real break in behavior appears to have occurred in 1984, well before any prudent investor would have viewed a tax reform such as the one that occurred in 1986 as a likely event. A more likely culprit is the Economic Recovery Tax Act of 1981, which lowered individual tax rates without lowering the corporate tax rate. That borrowing did not explode immediately after 1981 could very well be attributable to the serious recession that immediately followed.

Tax Losses and the Marginal Corporate Tax Rate

Not all changes in the marginal corporate tax rate occur through legislation. Firms that incur net operating losses have a current marginal tax rate of zero unless they can offset these losses against income in the previous three years to obtain a tax refund. Otherwise, they must carry the losses forward until sufficient income is earned to be offset by them, or until the losses expire after fifteen years.

While firms carrying losses forward may ultimately use them to shelter gains, the present value of such tax benefits is well below their face value, due to their potential expiration and the fact that they carry over without interest. Altshuler and Auerbach (1990) estimated that the present value of a dollar of tax losses carried forward by a representative corporation in the early 1980s was between forty and fifty cents. Since additional interest deductions simply add to the tax loss carryforward

[1] For further discussion, see Auerbach (1987). Also see Poterba (1987).

for a firm not currently paying taxes, the value of such deductions for such a firm may be less than half that indicated by the statutory corporate rate: a dollar of deductions may be worth only 17 cents or less, rather than 34 cents. Indeed, since interest deductions on new borrowing are received in the future, this reduction in their value applies to all firms except those certain never to incur tax losses.

The correction for the asymmetry of the tax system provides an additional rationale for the coexistence of debt and equity. For example, Altshuler and Auerbach estimated an average effective tax rate for interest deductions of approximately 32 percent during the early 1980s, when the statutory corporate tax rate was 46 percent. Cutting the effective corporate tax rate by nearly a third could reestablish an absolute tax preference for equity among high-bracket investors, even under current law.

The changing frequency of tax losses over time should also influence borrowing trends, since firms with tax losses have a weaker tax incentive to borrow. Panel and cross-section studies give some evidence that firm indebtedness does respond as predicted to high tax losses (Auerbach 1985; Givoly et al. 1989). But the aggregate pattern of tax losses in recent years does not offer any reason for borrowing to have increased.

Table 1 provides a breakdown of nonfinancial firms by tax status for the period 1969–88, based on a sample of firms taken from the COMPUSTAT Industrial and Industrial Research Files. The sample includes all firms for which a tax loss carryforward (zero or otherwise) was reported.[2] As is clear from the table, the fraction of firms reporting tax losses has risen sharply during the 1980s, falling only slightly in 1988 from its peak in 1987. One might argue that increased borrowing has led

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[2] The nonreporting rate varies over time, and is correlated with the fraction of firms reporting tax losses in the same year. This suggests that an unreported value may indicate the presence of a tax loss carryforward that is not of "material significance" from an accounting standpoint.

It should also be noted that the "accounting" tax loss carryforwards reported on COMPUSTAT differ in some cases from the true tax loss carryforwards. However, there is no machine-readable source of the correct measures. Even if one is willing to examine the financial statements of individual firms, the problem of missing data is much more severe for the true tax loss carryforward measure, leading to a substantial underreporting in the aggregate (Auerbach and Poterba 1987).

The fractions reported in Table 1 follow the same pattern through 1982 as those given by Altshuler and Auerbach (1990) based on actual corporate tax returns but, even if missing values are included, also appear to underrepresent the fraction of firms actually having tax loss carryforwards. To evaluate the pattern of tax losses over time rather than their exact level, however, the accounting measure seems adequate. The same general pattern was found for samples of firms drawn only from the Industrial File (that is, those that had not disappeared before 1988) and those with complete data for the entire period 1969–88.

Table 1
Tax Loss Carryforwards in the United States
Percentage of Nonfinancial Firms Reporting:

Year	Carryforward = 0	Carryforward > 0	Carryforward Not Reported
1969	95.5	3.2	1.2
1970	96.7	2.6	.7
1971	95.5	3.6	1.0
1972	96.0	3.7	.3
1973	95.8	3.2	1.0
1974	94.7	3.9	1.5
1975	95.9	3.0	1.2
1976	94.4	4.1	1.5
1977	93.8	4.3	1.9
1978	93.3	5.1	1.6
1979	91.6	5.3	3.1
1980	91.0	5.6	3.3
1981	91.6	6.0	2.4
1982	89.7	6.4	3.9
1983	88.2	7.4	4.4
1984	86.7	8.4	4.9
1985	83.9	11.1	5.0
1986	82.2	11.8	6.0
1987	81.5	11.9	6.6
1988	83.8	10.5	5.7

Notes: Sample includes all nonfinancial firms on COMPUSTAT Industrial and Industrial Research Files having data on debt and equity values.
Percentages are weighted by firm values (debt plus equity).

to this outcome, but then a *reduction* in the incidence of tax loss carryforwards could not have been a causal factor itself. If it has played a role at all, the asymmetry of the tax system has mitigated the urge to borrow.

Untrapping the "Trapped Equity"?

The recent increase in equity retirements raises an important and controversial issue regarding the impact of taxation on corporate financial policy. A particularly puzzling aspect of corporate behavior over the years has been the decision of firms to pay dividends to shareholders subject to ordinary income taxes when an apparently dominant form of distribution, the repurchase of a firm's own shares, has been available. Since shareholders pay capital gains taxes on such redemptions, such transactions traditionally have had two tax advantages. First, capital gains were taxed at a lower rate. This advantage disappeared (perhaps

temporarily) in 1986. However, a second advantage remains, the ability to deduct the basis of shares redeemed in calculating one's tax liability. Since redemptions are essentially equivalent to dividends in other respects, it is difficult to use standard arguments (for example, signalling) to rationalize the choice of dividends over repurchases by firms.[3]

Given that dividends exist, some controversy remains over the extent to which they influence the cost of equity capital. While the traditional approach has been to estimate the effective tax rate on equity earnings as a weighted average of tax rates on dividends and capital gains based on payout ratios, this is inappropriate to the extent that marginal equity funds are generated internally. Since the retention of earnings relieves shareholders of the need to pay taxes on dividends, this lowers the cost of equity capital, making the effective capital gains tax rate the correct measure of the individual tax burden on all returns to equity and the dividend tax rate irrelevant in computing the cost of funds (Auerbach 1979; Bradford 1981; King 1977). A corollary of this view is that taxes on distributions in excess of the effective capital gains tax rate are unavoidable and hence capitalized into the value of corporate shares. Note that the effective capital gains tax rate in this context takes into account the deferral advantage and possibility of avoidance at death that taxpayers with capital gains tax liabilities enjoy.

While a dispute continues about whether this "new" view or the traditional one is correct (Auerbach 1983; Poterba and Summers 1985), neither provides an explanation for the existence of dividends. In effect, the theories differ with respect to whether new equity funds are seen to come from a reduction in current distributions or an increase in the sale of new shares, but neither offers a prediction of the *form* of the distributions a firm makes. Each theory would be entirely consistent with firms minimizing the taxes actually paid by shareholders on the distributions. Thus, the explosion of share redemptions in recent years tells us little about which theory is "correct." However, this "discovery" of share repurchases has different implications for the cost of capital under the two hypotheses. For the traditional view that prescribes a weighted-average approach to measuring the tax rate on equity, there would be a reduction in the marginal equity tax burden. Under the alternative view, that taxes on distributions do not exert a marginal effect, the discovery would simply raise share prices.[4]

Have corporations really learned to avoid the dividend tax? If so,

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[3] For one attempt in this direction, see Bernheim (1988).

[4] The tax reduction would also be likely to raise share prices under the traditional approach, since distributions from existing assets would be taxed at a lower rate and investment would be encouraged by the lower marginal tax rate. However, this increase in value would be similar to that associated with any uniform income tax reduction.

Table 2
Disposition of Earnings and Sources of Funds, U.S. Nonfinancial Corporations
Billions of Dollars

Year	(1) Earnings	− (2) Dividends	− (3) Redemptions	= (4) Retentions	+ (5) Equity Issues	+ (6) Net Borrowing	= (7) Funds Raised
1980	89.8	61.0	8.2	20.6	21.1	57.8	99.5
1981	108.3	67.6	33.0	7.7	21.5	102.1	131.3
1982	92.9	72.0	22.5	−1.6	28.9	43.4	70.7
1983	135.5	78.0	16.5	41.0	40.0	54.4	135.4
1984	178.9	81.0	92.5	5.4	18.0	170.3	193.7
1985	185.3	84.0	106.5	−5.2	25.0	132.4	152.2
1986	184.8	89.9	118.6	−23.7	37.8	173.8	187.9
1987	173.6	95.5	112.0	−33.9	35.5	136.8	138.4
1988	181.6	103.3					

Source: Columns 1 and 2: Board of Governors of the Federal Reserve System (1988b).
Earnings are worldwide, after-tax, adjusted for capital consumption allowances and investment valuation adjustments.
Data for 1988 come from unpublished Board of Governors data.
Columns 3, 5, and 6: Joint Committee on Taxation (1989).
Redemptions include retirement of shares of acquired firms.

one would expect them to have replaced dividends with share repurchases. Evidence of this is not immediately evident, at least in the aggregate. The increase in net share redemptions has come about through an increase in gross retirements rather than a decrease in gross new issues, and the fraction of distributions accounted for by these redemptions has certainly risen in recent years. However, no decline in dividends has occurred, and a significant fraction of the redemptions have been associated with takeovers rather than self-tenders.

Table 2 presents changes in the sources and uses of funds in the U.S. nonfinancial corporate sector from 1980 through 1987. Given the cash-flow identity of each firm and hence the corporate sector as a whole, the increase in net redemptions must have been associated with an increase in profits (net of taxes and interest payments), a decrease in dividends, an increase in borrowing, a decrease in funds available for investment, or some combination of these events (all measured relative to trend). Dividends have grown quite smoothly over the period, while there has been no obvious trend in investment. Clearly, a sharp correlation exists between borrowing and redemptions.

Even though dividends have continued to grow, this does not prove that repurchases have not slowed their growth. To obtain a more precise estimate of the extent to which firms may have used repurchases to substitute for dividends, we use a typical model of aggregate

Table 3
Actual and Predicted Dividends of Nonfinancial Corporations
Billions of Dollars

Year	Actual	Predicted[a]
1984	81.0	84.7
1985	84.0	93.3
1986	89.9	102.2
1987	95.5	111.4
1988	103.3	123.0

[a] Estimated using a dynamic simulation based on equation (1) in the text.

dividend policy,[5] estimated over the sample period 1947–83 (1983 being the last year before the explosion of repurchases), to predict dividends for the years 1984–88. If the model overpredicts aggregate dividends, this result will indicate that firms have replaced them with repurchases.

The estimated equation is:

$$\Delta \log(DIV) = \underset{(1.62)}{.14} + \underset{(1.20)}{.03}\,\Delta \log(Y) + \underset{(2.36)}{.06}\,\log(Y_{-1}) + \underset{(0.26)}{.09}\,\Delta \log(T) + \underset{(1.37)}{.43}\,\log(T_{-1}) - \underset{(-2.41)}{.15}\,\log(DIV_{-1}) \quad (1)$$

$R^2 = .243$
Durbin-Watson statistic = 1.95
(t-statistics are in parentheses)

where DIV and Y are nonfinancial corporate dividends and earnings (as given in Table 2) divided by the GNP deflator and T is one minus the tax rate on dividends, taken from Poterba (1987, Table 4). Dynamic simulations based on equation (1), beginning in 1984, yield the predicted dividends given in Table 3. The results suggest that even though dividends have grown during the last five years, they would have grown more quickly had previous behavior been followed. In 1987, for example, dividends were $15.9 billion less than predicted. If one attributes this change entirely to the substitution of share repurchases for dividends, then approximately 30 percent of the $52.6 billion of share repurchases (Bagwell and Shoven 1989) that occurred in 1987 replaced

[5] The equation is essentially the one estimated by Poterba (1987, Table 5, column 2). The coefficients are somewhat different, owing to differences in sample periods and data definitions.

dividends. Thus, while substitution for dividends may have been significant, it is not the major explanation for the rise in the level of share repurchases.[6]

Moreover, an even greater amount of equity than was repurchased by firms themselves disappeared through cash-financed takeovers, with the total value of shares redeemed through both channels equaling $112 billion in 1987. One can therefore explain only a small percentage of total equity retirements as having occurred in lieu of concurrent dividends. While it is not clear what fraction of acquisitions were associated with additional borrowing, a significant fraction of the total equity retired through acquisitions, $46.4 billion, came through leveraged buyouts,[7] which have had initial debt-value ratios close to one.

Thus, the pattern of equity retirements appears to be much more one of borrowing to finance takeovers and, to a lesser extent, to repurchase one's own shares rather than one of altering the nature of distributions to shareholders. It is perhaps more accurate to characterize it as a shift from equity to debt through the redemption of shares rather than a change in the form of corporate distributions. It is therefore unclear whether the mix of *prospective* distributions and the associated taxes thereon has changed. If firms will continue to rely on dividends for distributions, little has changed. All of this must be said with a fair degree of uncertainty, for we still understand very poorly what drives firms to pay dividends.

Takeovers and Leverage

The preceding empirical evidence suggests that much of the recent shift from equity to debt in the U.S. corporate sector has been associated with takeover activity, including leveraged buyouts. Indeed, to the extent that managers of potential targets have felt compelled to borrow as a defensive measure, to avoid being taken over, much of the

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[6] Additional evidence from data on individual firms suggests that the high level of share redemptions in recent years has not been primarily a phenomenon of dividend replacement. A sample with complete data for the period 1969–88 was used for the investigation. This sample accounted for over half the dividends of all nonfinancial corporations during the 1980s, and so should be fairly representative.

Before the period 1984–88, repurchases were small in aggregate size and did appear to be used in place of dividends. For the period 1979–83, only 30 percent of the firms in the sample (weighted by firm value) repurchased at least 0.5 percent of their equity in at least one of the five years. For the repurchasing subset of firms, however, total repurchases exceeded total dividends in each of the five years. During the next five-year period, 1984–88, repurchasing became much more widespread, with only 21 percent failing to repurchase at least 0.5 percent of shares in at least one year. However, for this group, dividends exceeded repurchases in every year of the period.

[7] U.S. Joint Committee on Taxation (1989, page 11).

borrowing not directly associated with acquisitions may also be attributable to the increase in takeover activity.

Many observers have viewed the tax advantages of borrowing as an incentive to engage in takeovers. However, this argument has its problems. Foremost among them is that firms can gain the tax advantages of borrowing by purchasing their own shares rather than the shares of another company.

The Tax Reform Act of 1986 contained various provisions aimed at curtailing some of the other tax benefits associated with corporate takeovers.[8] It is possible that this change contributed to an increase in firms borrowing to repurchase their own shares (leveraged buyouts are essentially in this category, from a tax perspective) as a substitute for more traditional debt-financed acquisitions of one corporation by another, but it does not explain why debt-financed equity retirements as a whole should have increased in the past couple of years.

Debt, New Equity and Old Equity

Much of the discussion of debt versus equity has ignored the different choices facing new or expanding companies and those with a sufficient base of existing equity. Since all evidence suggests that the rise in corporate indebtedness has come about through increased borrowing by existing companies, it is important that any analysis of the subject apply to the replacement of existing equity with debt rather than borrowing in lieu of issuing new equity.

This distinction is essentially the one made above between the "new" and "traditional" views of the burden of dividend taxation (and, more generally, any taxes on cash distributions). While a single tax (that of the bondholders) is levied on newly issued debt, two levels of taxation (on corporate income and distributions) are levied on newly issued equity. Firms borrowing to replace equity avoid the double taxation of future equity income, but must "prepay" the shareholder-level tax immediately when the funds are distributed. It is not of obvious relevance whether current distributions of equity take the form of repurchases, since they could have done so in the future had the equity not been redeemed. Thus, the recent ascendancy of share repurchases and their favorable tax treatment cannot in themselves explain why firms would wish to substitute debt for existing equity, unless this preferred method of disbursing equity funds is perceived to be temporary (as would be the case if a crackdown on repurchasing activity were

[8] The changes and their implications are discussed in Auerbach and Reishus (1988).

anticipated). Otherwise, one can view an increase in the ability to repurchase simply as a permanent reduction in the rate of tax on distributions.

Just as firms face a smaller marginal tax rate on investment of retentions than on investment financed by issuing new shares, they have a smaller incentive to replace existing equity with debt than to borrow instead of issuing new equity. In each case, it is the avoidance of taxes on current distributions that favors the use of existing equity over new equity. This distinction is of particular relevance when one considers the effects of proposals for the reform of the corporate tax, since they differ markedly in their recognition of it.

Summary

The recent increase in borrowing by nonfinancial corporations is difficult to attribute to the Tax Reform Act of 1986. While the overall tax incentives for some equity investors to hold debt increased, the incentives for other significant equity investors to purchase debt declined. The growth of corporate equity retirements is clearly related to the increase in borrowing, but the tax advantage of redemption over dividends cannot in itself explain the shift toward debt. Another potentially important tax factor, the reduction in the value of interest deductions associated with limitations on the deductibility of net operating losses, points in the opposite direction.

If tax changes have not induced the change in borrowing, however, the underlying imbalances always present in the tax system may have contributed to it. In this sense, the borrowing could be tax-related even if it is not tax-induced, and the need to reduce the remaining imbalance between debt and existing equity might have increased even if the imbalance itself has not.

This distinction requires an understanding of the nontax factors affecting borrowing. If borrowing to retire equity has even a small tax advantage, other, nontax costs must prevent equity from disappearing entirely. These costs might include increased bankruptcy risk, distorted choice of investments and, potentially, an inefficiently short planning horizon.[9] If these nontax costs have not declined, an increase in borrowing would represent an increase in the overall social cost of financial distortions. On the other hand, a reduction in any of these costs, as through increasing efficiency in financial markets or a more competitive market for corporate control, could have led firms to take greater advantage of

[9] No consensus exists that forcing a decline in horizons and, more generally, putting managers "under the gun" would reduce efficiency. Some, for example Jensen (1989), see this as a major benefit of additional borrowing.

whatever tax advantage to borrowing already existed. In this case, the total social costs of tax-driven borrowing would not necessarily have increased. While more of the distortionary activity, borrowing, would be occurring, the financial innovations would have made the activity itself less distortionary. In the extreme case that all real distinctions between debt and equity cease to exist, firms would be led to replace all equity with debt to the extent that any tax advantage at all were available, but the distortion of financial behavior would be entirely absent.[10]

Tax reform may be important even if recent tax changes are not at fault. The case is weakened, however, if the borrowing has resulted from real (as opposed to perceived) reductions in the distinction between debt and equity.

The Gains from Reforming the Corporate Tax

Arguments favoring reform of the corporate tax take two forms. Some are based on welfare arguments concerning the economic distortions of increased corporate borrowing, while others stress the revenue loss to the government if tax-advantaged debt supplants equity. Though evaluating the significance of the economic distortions of borrowing is beyond the scope of this paper, one should be cognizant that, as stressed above, increased borrowing may be due in part to a reduction in such distortions. In addition, the importance of the revenue-loss argument may well have been overstated.

First of all, if debt is tax-favored and firms use more of it, the ensuing revenue losses will be associated with reductions in the marginal corporate tax burden and the corporate cost of capital in the United States. Although reducing the marginal tax burden on new corporate investment would not necessarily increase social welfare, neither is it obviously a destructive policy. Many analysts have viewed with envy the high debt-equity ratios in Japan, interpreting them as a partial explanation for the lower cost of capital there (for example, Hatsopoulos 1983). Second, the estimated losses of revenue from increased indebtedness may be overestimated.

Several factors contribute to such overestimates. Some observers simply ignore the taxes paid by recipients of interest payments on the newly created debt. A more subtle point is that replacements of equity with debt cause a speeding-up of the payment of capital gains taxes on

[10] These changes, and their welfare implications, are discussed in more detail in Auerbach (1989). Also see Bernanke and Campbell (1988).

retired shares.[11] In addition, although it is customary to apply average marginal tax rates on existing interest receipts to estimate the taxes paid on additional interest, such an assumption has little justification.

For purposes of illustration, consider a model in which each firm issues risky equity and riskless debt, with the underlying before-tax returns to the firm unaffected by its financial structure. Investors choose portfolios of debt and equity based on both tax preferences and the motive for diversification. This means that all investors will hold some equity, even those with a strong tax preference for debt, in order to bear some risk and achieve the risk premium that comes with doing so. Now, suppose each firm replaces a fixed fraction of its equity with debt, repurchasing the shares from its shareholders. The mean cash flow passing to owners of equity will decline and the variance of this cash flow will be unaffected, so that the value of equity will fall and the riskiness of its rate of return will increase. Who will hold the additional debt? Consider the following logic.[12]

If existing equity owners simply use the sale proceeds to buy the new debt, they will essentially undo the changes in financial structure generated by the firms, following the standard Modigliani-Miller homemade leverage approach. Investors will hold the same claims to each firm as before, but packaged in different ways. Absent taxes, this would result in the initial equilibrium and no further adjustments would occur. In the presence of taxes, however, a new equilibrium will result.

The shift in each firm's financial structure toward more risky equity will make equity investment in general more attractive to those low-bracket taxpayers with a relative tax preference for debt, since they may now assume a given amount of risk while committing less wealth to the asset, equity, that they would prefer to avoid for tax reasons. Hence, we would expect to observe further shifts toward equity by lower-bracket taxpayers, with more of the debt being purchased by higher-bracket taxpayers. The resulting distribution of purchasers of the new debt will therefore have a higher average marginal tax rate than the distribution of initial equity owners. Note that this argument is not based on any assumption about the initial distribution of equity ownership or the level of risk aversion of any class of investors; nor does it depend in any way on the identity of investors directly purchasing the newly issued bonds.

Given the different distributions of debt and equity holdings, this

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[11] See Jensen, Kaplan and Stiglin (1989). These authors also include tax revenue coming from increased operating efficiency in their calculations, but these do not derive directly from the transaction replacing equity with debt.

[12] The following arguments may be demonstrated rigorously using the model presented in Auerbach and King (1983), assuming that each investor is at an interior portfolio optimum both before and after the change in financial policy.

Table 4
Marginal Tax Rates on Interest Receipts, Based on Ownership Patterns of Debt and Equity
Percent

Group	Marginal Tax Rate	Percentage of Equity	Percentage of Debt
Households	21.7 (Debt) 25.3 (Equity)	54.2	7.6
Tax-Exempt Organizations	0	11.1	4.4
Foreigners	0	6.1	13.3
Banks and Thrifts	14.9	.2	10.4
Insurance Companies	20.0	5.4	37.6
Private and Public Pension Funds	0	22.6	25.0
Brokers and Dealers	34.0	.4	1.6
Addendum: Average Marginal Tax Rate		15.0	11.2

Sources: Ownership percentages (for 1987): Board of Governors of the Federal Reserve System (1988a). Mutual fund holdings of debt and equity distributed among groups. Tax-exempts separated from household sector according to percentages given in U.S. Joint Committee on Taxation (1989).
Tax rates (for 1988): households, Hausman and Poterba (1987); other sectors, Summers (1989).

weighting scheme leads to a higher estimate of the average marginal tax rate on new interest receipts. An estimate of this difference is provided in Table 4, showing the average marginal tax rates on interest receipts based on ownership of debt and equity. Moreover, it should be kept in mind that not all additional interest deductions will be taken at the 34 percent corporate tax rate. The net gap between effective corporate and bondholder tax rates could well be as little as 10 percentage points, given the current incidence of tax losses among firms.

Proposals to Reform the Taxation of Corporate Cash Flows

One can distinguish two broad classes of proposals aimed at dealing with imbalances between debt and equity.[13] Some would attempt to restrict particular forms of borrowing associated with perceived abuses and "loopholes," while others would be aimed at a more general rationalization of the tax treatment of debt and equity.

Despite their continuing popularity, specific interest limitations are difficult to justify as an appropriate policy tool, except in cases where better-suited approaches are politically impractical or otherwise not

[13] The analysis of this section draws heavily on Auerbach (1989), which discusses the various reform proposals in greater detail.

possible. From a theoretical perspective, few situations exist in which one would wish to control specific types of borrowing rather than regulating directly the objectionable activities with which the borrowing may at times be associated. Moreover, borrowing restrictions may be difficult to enforce.[14] The discussion that follows focuses, therefore, on proposals to bring the general treatment of debt and equity into balance.

Traditionally, analysts have considered integrating the corporate and individual income taxes, converting the corporate tax into a withholding mechanism for the individual income tax. Full integration has never been adopted, but partial integration schemes to alleviate the double taxation of dividends have been implemented in several countries.

Beyond full and partial integration schemes, two alternative proposals have received considerable attention in recent years, the corporate cash flow tax and the proposal for limited dividend relief of the American Law Institute. Each of these proposals has a particular advantage over integration schemes in limiting windfalls to owners of existing equity, but each would also introduce new problems. This section of the paper reviews and compares the effects of corporate tax integration and the newer approaches to corporate tax reform.

Integration

Under full integration, investors would be taxed on a partnership basis. The single, individual tax on equity income would eliminate the importance of the debt-equity distinction; all corporate-source income would be taxed at the individual's tax rate.

Much of the opposition to full integration has been of a technical nature (see McLure 1979), but other difficulties are also found. Because it would subject all equity income to a single tax at the individual's tax rate, few question that an integrated tax system would produce windfalls for the owners of existing equity, for the prospective tax burden on such equity would have been reduced. More disturbing, however, is the prospect that such windfalls would bring with them little positive contribution to the incentive to invest.

Already discussed above is the argument that taxes on distributions from *existing* equity are capitalized into the value of shares and do not influence the marginal cost of capital for reinvested funds. This would mean a current effective rate of tax of 34 percent on reinvested equity funds, plus the effective rate of capital gains tax on accumulated

[14] See Auerbach (1988) for a general discussion. In the particular context of takeovers, see Bulow, Summers and Summers (1989).

earnings, compared to the 28 percent or 33 percent tax rate that most investors would face under an integrated tax system. Put simply, investors would receive a small cut in their marginal tax rates and a large windfall, equal to the present value of the capitalized taxes on distributions forgiven. This would include distributions from all net assets, equal to returns to existing capital plus economic rents less interest payments on preexisting debt.

Because taxation would be only at the investor level, an integrated tax system would cease to tax foreign and tax-exempt shareholders at all on their corporate-source income, treating equity income the way that interest income is now treated. This would increase the relative incentives for foreigners and tax-exempts to hold equity.

Dividend Relief

Dividend relief is much more easily implemented than full integration, for it requires the measurement only of dividends, rather than all earnings. Given the traditional view that the serious problem of corporate double taxation applies primarily to earnings distributed as dividends, dividend relief has been seen as an acceptable solution to the distortions of the corporate tax.

The two basic approaches to dividend relief differ with respect to whether the corporation or the shareholder receives the tax rebate. Relief at the corporate level comes in the form of a full or partial deduction for dividends paid, often expressed in terms of a lower tax rate on distributed earnings, or a *split-rate* tax system.

In practice, split-rate systems have typically allowed only partial deduction for dividends. In Germany, for example, the split-rate system in the 1980s had rates of 56 percent and 36 percent on retentions and distributions (King and Fullerton 1984). In Japan, the rates are currently 42 percent and 32 percent (Japanese Ministry of Finance 1988).

The shareholder-level alternative to the split-rate system is known as the *imputation system,* since in calculating their income shareholders add to the dividends they actually receive additional imputed income equal to some or all of the taxes the corporations are assumed to have paid on the earnings distributed. The shareholders are then given credit for these imputed taxes in calculating their own income, in exactly the way that taxes withheld by employers on wage and salary income are included by employees in their taxable income but also are creditable against their tax liability. In the United Kingdom, for example, the imputation system permits a credit at the basic individual tax rate, so that most taxable investors neither owe additional tax nor receive a refund for excess taxes withheld (King and Fullerton 1984).

As with the split-rate system, any degree of dividend relief is

possible under an imputation system, according to the fraction of corporate taxes imputed. In general, the two systems are equivalent in the case of taxable dividend recipients. The main difference is in the treatment of foreign and tax-exempt shareholders. Since the imputation system allows a credit for corporate taxes only against a shareholder's tax liability, those paying no taxes would receive no credit. Hence, one may view an imputation system as being equivalent to a split-rate system plus a withholding tax at the normal corporate tax rate on dividends distributed to low or zero-bracket shareholders.

Like full integration, dividend relief suffers from the major drawback that it is provided at the very least for all dividends paid to taxable investors, including dividends from existing equity for which there may be very little change in the incentive to reinvest funds. Since the relief would focus on dividends (and, as discussed next, firms will have the incentive to make dividends the main form of distributions), one may view either proposal as being equivalent simply to lowering the tax on distributions directly at the shareholder level. To the extent that the marginal source of equity funds is retained earnings, this would not change the effective tax rate on equity-financed investments at all. Given the revenue cost of dividend relief, this lack of marginal impact is a serious drawback.[15]

An additional effect of both dividend relief and full integration would be that, with dividends relieved of double taxation, firms would have no tax incentive to repurchase shares instead. It should be stressed again, however, that the removal of the incentive to repurchase shares rather than pay dividends should have little effect on the incentive to replace existing equity with debt.

The American Law Institute Proposal

In 1982, the American Law Institute published a volume considering the reform of the U.S. corporate income tax that included proposals by the project's reporter, William Andrews, to provide dividend relief in a manner that would avoid the windfalls common to the schemes discussed above. The Institute/Andrews scheme is fairly elaborate in its detail, and has gone through several draft versions, the most recent published in June 1989. To understand this plan and its effects, it is

[15] Up-to-date revenue estimates for full and partial integration schemes are hard to obtain. However, the 1984 Treasury proposal for a 50 percent dividends-paid deduction estimated a total (corporate and individual) revenue cost of $31 billion for fiscal year 1990 (the last year for which projections were provided).

useful to consider first a much simpler one that shares many of its important characteristics.

The basic problem the American Law Institute plan seeks to attack is that dividend relief is a windfall for equity funds already within the corporate solution. A direct attack on this problem would be to couple a dividends-paid deduction with a tax at the corporate rate on the present value of deductions attributable to dividends paid from existing equity. One would not need to keep track of these dividends. Since dividends are normally taxable to recipients to the extent that they are paid out of a firm's accumulated earnings and profits, the stock of these earnings and profits would serve as an appropriate tax base. The incentive effects would be the same as under a dividends-paid deduction alone, but the revenue effects would be quite different. Even if the windfalls tax were made payable over several years, its revenue could well exceed that lost from the dividends-paid deduction for many years (though not in the long run).

The idea of taxing windfalls is not new. However, proposals to recoup windfalls through explicit taxes have commonly been opposed as being retroactive and unfair, even when they may only partially offset windfall gains delivered implicitly at the same time.[16] The American Law Institute approach achieves such a tax on windfalls, but does so implicitly, in effect making the payment of the windfalls tax (the "toll charge") and qualification for dividend relief a decision of the firm, allowing each firm the option of not qualifying for dividend relief and not paying a windfalls tax.

Despite its many incarnations and sophisticated analysis, the Institute's plan has retained its basic thrust and purpose of providing dividend relief limited to newly contributed equity. It has two major components. The first would provide limited dividend relief along the lines of the dividends-paid deduction. The second would restrict the ability of firms to make tax-favored nondividend distributions of funds not qualifying for dividend relief.

The plan would distinguish between "old" and "new" equity, with shares issued after its enactment being "new" and qualifying for special treatment under the plan's first component, a deduction for dividends paid. The allowable deduction would be calculated by multiplying the value of funds raised from the sale of new shares by some reasonable rate of return. For example, if the plan became effective on January 1,

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[16] This was the case, for example, for an element of the President's Tax Proposals of May 1985, which would have recouped from corporations the tax reduction due to the corporate rate cut on that component of taxable income arising from previous accelerated depreciation deductions. That scheme would have raised considerable revenue.

1990 and the allowable rate of deduction were 5 percent, a firm issuing $1 million of equity after this date would be entitled to deduct up to $50,000 of dividends annually thereafter. If the firm issued more equity subsequently, its allowable dividend deductions would increase.

Like the other forms of dividend relief discussed above, this part of the American Law Institute plan would alleviate the double taxation facing newly contributed equity capital; for such equity, the plan would be essentially identical to a dividends-paid deduction. This first component of the plan, providing dividend relief for newly contributed equity, is neither problematic nor controversial. It simply does for a certain class of shares what standard dividend relief would do for all. It is the second provision, which aims to curtail nondividend distributions, that has caused controversy (see, for example, Jensen 1989).

The tax on nondividend distributions would apply to shares repurchased by a corporation itself as well as shares redeemed by another via a cash acquisition. It is intended to offset the current tax advantage such distributions enjoy, attributable to the basis that shareholders may deduct from capital gains tax liability (and, before 1987, the lower rate at which such capital gains were taxed). Under the original 1982 American Law Institute plan, this tax would have been an excise tax on the distributions themselves, added to the individual income tax burden. The 1989 version includes instead a corporate-level minimum tax on nondividend distributions at the tax rate of most high-income individual investors (28 percent), creditable against individual tax liability on the distributions. In either case, low-bracket investors would actually face a higher tax burden on nondividend distributions than on ordinary dividends, while the burdens would be similar for high-bracket investors.

Why is the tax on alternative distributions seen as necessary by its supporters, and why is it opposed by others? The relevant question here is what the appropriate benchmark is. The American Law Institute plan takes the view that dividends are the normal form of distribution and that taxes on such distributions are also normal. From this perspective, the recent reduction in taxes through increased nondividend distributions represents an unintended windfall to which shareholders are not entitled. Further, if firms see the nondividend option as unlikely to continue indefinitely into the future, the new opportunity to convert old equity into new equity qualifying for the plan's dividend deduction will spur further nondividend distributions unless the tax on alternative distributions is also instituted. Others, taking the current situation as the normal state of affairs, would view the tightening of rules on nondividend distributions as unfair.

Because the first of the American Law Institute plan's provisions would reduce taxes and the second would increase them, it is natural

that the two parts are viewed with different degrees of enthusiasm by those who would be affected by the plan. Together, the provisions may be seen as providing dividend relief for new equity while eliminating all windfalls from existing equity *relative to the full taxation of all distributions.*

The analysis of the American Law Institute plan to this point has been based on a permanent, unannounced enactment of the plan. However, in a world of uncertain and temporary tax policy, a change in the tax on distributions could do more than change the value of taxes capitalized in equity values. Unlike a direct windfalls tax, the plan's toll charge, consisting of taxes on dividend and nondividend distributions from existing equity, would be paid only upon the distribution of these funds. Given a constant tax system, this distinction would be irrelevant; that is what makes the analogy to the windfalls tax useful. But given the option to delay distributions, the possibility of distorted behavior is very real under the plan.

If, for example, investors expected the tax on alternative distributions to be temporary, the incentive to delay share repurchases and cash-financed takeovers could be significant. In fact, if a phase-in to full dividend deductibility for old and new equity alike were anticipated, even current dividends would be discouraged. Only a convincing, permanent adoption of the American Law Institute plan would avoid these incentives, and consistency of this policy over time would require the system maintaining the distinction between old and new equity to be permanent. Likewise, anticipation that the plan would be enacted would increase nondividend distributions and reduce equity issues. Even if the enactment came entirely as a surprise, there would still be the inevitable question of fairness in transition: for example, how to treat the company that made a large equity issue a day before the provision of relief for new equity took effect.

The Cash-Flow Corporate Tax

Direct taxes on individual consumption or cash flow have enjoyed considerable intellectual support in recent years (for example, Andrews 1974; Bradford 1980). Such a tax base would identify a household's consumption indirectly, using the identity that income is exhausted by saving, taxes, and consumption, by allowing a deduction for saving from the income tax base. Although corporations do not consume, a cash-flow tax base for the corporation has its attractions, too. Like the individual consumption tax, it would not alter the net return to saving.

The literature has noted the attractiveness of a corporate cash-flow tax as part of a system of consumption taxation (Institute for Fiscal Studies 1978; Aaron and Galper 1985), but the corporate cash-flow tax

has, more recently, been proposed as a freestanding reform of the corporate tax (Feldstein 1989).

The two basic approaches to corporate cash-flow taxation are referred to by the Meade Committee (Institute for Fiscal Studies 1978) as the R(eal) versus the R(eal)+F(inancial) bases. The two approaches differ with respect to their treatment of borrowing and interest payments. While the R-base would eliminate interest deductions (and not tax the corporation's interest income), the R+F-base would preserve such deductions (and taxes) but add borrowing to (and deduct lending from) the tax base. Perhaps the most significant difference between the two approaches would be in their treatment of financial intermediaries, whose profits, interest receipts less interest payments, would be tax exempt under the R-base. For nonfinancial corporations, the approaches would have similar effects, although the timing of tax payments by firms could be quite different.

To convert the present corporate income tax to a cash-flow tax, one would replace depreciation deductions with an immediate deduction for all new investment and, under the R+F-base, include all net borrowing in the tax base. The resulting tax base would be the firm's receipts less expenditures, that is, its net cash flow. This cash flow is the sum of all the firm's current distributions to its shareholders, including dividends plus share repurchases. Given the previous discussion of the effects of taxes on distributions, one can see immediately that the cash-flow tax is nondistortionary: although it affects the value of the corporation, it imposes no additional tax on the return to earnings that are reinvested. Moreover, unlike other taxes on distributions (such as the dividend tax) it does not discriminate against newly contributed equity, since it is a tax on distributions net of new equity issues. New equity would not face a net tax, in present value, on its distributions, receiving an offsetting deduction upon its initial contribution. Thus, a move to the R+F-base would be equivalent to replacing the current corporate tax with a tax on all distributions from existing equity. In terms of marginal incentives, this outcome would be equivalent to the abolition of the corporate tax.

A similar analysis applies for the R-base, which has been discussed more frequently as a possible tax reform. By eliminating the deduction for interest payments instead of taxing net borrowing, the R-base would add net distributions to holders of existing debt (interest payments less net borrowing) to those already taxed under the R+F-base. Again, there would be no marginal impact of the corporate tax.

In comparing the impact of the cash-flow tax to the approaches previously considered, one may identify three significant differences:

(1) Unique among the proposals, the cash-flow tax would raise the corporate tax burden on debt-financed investment;

(2) Unique among the proposals, the cash-flow tax would cause the tax system as a whole to favor equity over debt;
(3) Like the American Law Institute proposal, but unlike the other schemes, the cash-flow tax would avoid giving windfalls to existing equity.

Under the current income tax, the effective corporate tax rate on equity-financed investments is close to the statutory tax rate of 34 percent (Auerbach 1987). However, owing to the full deductibility of nominal interest payments, the effective corporate tax rate on debt-financed investment is negative: marginal debt-financed investments will generate negative corporate tax liabilities, since more than the real cost of funds is deductible. Hence, a move to the cash-flow tax will, by setting both effective tax rates to zero, raise the tax burden on debt and lower the burden on equity. This demonstrates the first proposition in the above list.

The second proposition given above also follows immediately. While the *corporate*-level marginal tax rates on debt and equity would be the same under a corporate cash-flow tax, the overall tax rates would not be, since even under current law the treatment of capital gains is favored relative to ordinary interest income. The individual tax advantage to equity, combined with the neutral corporate treatment of debt and equity, would tip the balance toward equity. Depending on the contribution of the dividend tax to the effective individual equity tax rate, this gap could be considerable. The treatment of equity under the cash-flow tax would be more favorable than under a dividend relief scheme, since there is no tax on retained earnings. The treatment of debt is less favorable, since only the cash-flow tax would eliminate the negative corporate tax on debt-financed investment.[17]

Finally, like the American Law Institute proposal, the cash-flow tax would avoid windfalls. Whereas a deduction for all dividends paid, for

[17] In favoring corporate equity over debt, the corporate cash-flow tax might also favor corporate equity over noncorporate investment, which is currently taxed once, to the income recipient, like corporate debt. The answer would depend on how the tax reform would affect noncorporate business, an issue typically ignored in recent policy discussions.

If the noncorporate sector were covered by the new provisions (immediate write-off of assets plus the elimination of interest deductions), then all business borrowing would be equally discouraged relative to equity, and the current relative treatment of corporate and noncorporate equity would be maintained. If, however, there were no change in the treatment of noncorporate equity and debt, this would make noncorporate debt more attractive than corporate debt, and noncorporate equity potentially less attractive than corporate equity, leading to a divergence in the financial incentives at corporate and noncorporate levels.

This issue would clearly require more thought were the corporate cash-flow tax to be considered as a serious policy option.

example, would eliminate the corporate-level tax on all distributed income, including the corporation's pure economic rents and the returns to its existing capital, the cash-flow tax would not do so. If, during the transition period, it preserved the tax treatment of preexisting assets and liabilities by maintaining depreciation allowances for existing assets, allowing existing inventories to be deducted when used and (under an R-base) continuing the interest deductions of existing debt, the cash-flow tax would not alter the tax treatment of distributions from existing equity at all. It would be equivalent at the margin to the abolition of the corporate income tax but would avoid the windfalls. Like the American Law Institute proposal, its only effect would be at the margin. However, unlike that proposal, it would raise the effective marginal tax rate on debt-financed projects and would reduce the tax burden on *all* equity-financed projects, including those financed by existing equity.

The corporate cash-flow tax would, again like the American Law Institute plan, present serious transition problems. Even with a preservation of the tax treatment of existing assets and debt, firms would have a strong incentive to wait to invest if the adoption of a cash-flow tax were anticipated, for the immediate write-off of investment would be received only for new investment. In general, attempts to limit windfalls by distinguishing new from old activity may be subject to similar problems.

Recent estimates for the United States have found that a switch to corporate cash-flow taxation would broaden the corporate tax base, either raising revenue or permitting a reduction in the corporate tax rate without a revenue loss. For the period 1981–83, Aaron and Galper (1985) estimated that a tax rate of only 33 percent, rather than the then-prevailing rate of 46 percent, would have been necessary were a cash-flow tax base adopted. Gordon and Slemrod (1988) estimated that a switch to corporate cash-flow taxation would have increased tax revenues from nonfinancial corporations by $20.8 billion in 1983. However, for two reasons, these results likely overstate the positive revenue impact of adoption today.

First, both estimates are based on the pre-1986 period when depreciation allowances were accelerated and the investment tax credit applied. Thus, the immediate write-off of assets provided by cash-flow taxation would, in itself, have represented a smaller tax reduction than under current law. Moreover, both of the reported estimates are for the long run, and do not properly account for transition-period revenue losses. Based on information provided by Gordon and Slemrod (1988) in their own analysis, Auerbach (1989) found that maintaining depreciation allowances on existing corporate assets and interest deductions on the existing stock of corporate debt would have reduced the revenue gain of a switch to cash-flow taxation from the initial estimate of $20.8

billion to just under $7 billion. However, starting from the post-1986 tax system, with its reduced investment incentives, the same policy would likely lose revenue and reduce marginal tax rates overall. The revenue loss cannot be avoided unless less generous transition provisions are introduced or the corporate tax rate is increased.

The corporate cash-flow tax, like the American Law Institute plan, provides its equity incentives through tax reductions at the corporate level. Therefore, unlike an imputation system, it would extend the benefits of equity relief to foreign equity owners. However, just as a withholding tax could be used to convert the split-rate system into an imputation system, one could couple the cash-flow tax with a withholding tax on equity distributions to foreigners and nontaxable entities. Such a withholding tax was included in the corporate cash-flow tax considered by Aaron and Galper (1985).

Conclusions

The most significant problem one confronts in deciding whether and how to reform the tax treatment of corporate debt and equity is that the impact of taxation on corporate financial policy is poorly understood. Little evidence supports the view that changes in the tax environment have spurred the borrowing boom of the past few years. While the tax advantages of debt have increased for some equityholders, they have decreased for others. The increased incidence of tax losses has contributed further to a decline in the value of interest deductions overall.

The rise in equity retirements appears to be associated with conversions of equity into debt much more than a reduction in dividends; the dividend puzzle remains largely intact. However, the ability to redeem equity without incurring the tax cost of dividends does little to explain why the redemptions have occurred, since such favorable tax treatment would also have been available to future distributions from equity.

Given this uncertainty, one should tread carefully toward significant changes in corporate taxation. Rationalizing the treatment of debt and equity is in general a sufficiently desirable objective that it should be considered, even if recent changes in financial policy are not tax-driven. However, available alternatives all have their drawbacks, offering either revenue-losing windfalls or new complications and distortions. These costs must be measured against the costs of maintaining the current system, difficult as they are to estimate.

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Discussion

*David F. Bradford**

As usual, Alan Auerbach has given us a very nice paper, one that includes some elegant and underplayed formal touches about the effect of taxes when general equilibrium portfolio effects are taken into account. In my brief time I am not going to linger on those refinements, but instead will emphasize some of the economic analytical problems that he has highlighted. Most of these problems or puzzles are familiar to tax specialists, but may not yet be sufficiently appreciated by the wider community interested in corporate tax policy.

Corporate Tax Puzzles

The challenge to economic analysis is nowhere clearer than in the case of the dividend paradox to which Auerbach refers, and I would like to work through it in a bit more detail to emphasize its nature. The broad question is, why do corporations pay dividends. But it is not, as often posed more specifically, why do corporations not retain more earnings. Instead it is, why, given a desire to make a distribution to shareholders, corporations use dividends, as the term is defined in the tax law, rather than an alternative form of distribution that is more favorably taxed. The alternative form on which I would like to focus is the use of corporate funds to purchase its own equity shares. Table 1 lays out the consequences of distributing $1 of funds from a corporation to a shareholder

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Table 1
Effect of Alternative Routes of $1 Distribution to Shareholders

	Dividend	Stock Repurchase
Corporation Bank Account	−1	−1
Corporation Memo: E & P Account	−1	
Shareholder Bank Account	1−m	1−g(1−b)
Shareholder Stock Value	−s	−s−e
Shareholder Memo: Basis		−b

m = Shareholder's marginal tax rate on ordinary income.
g = Shareholder's marginal capital gains tax rate.
b = Shareholder's basis in $1 worth of the stock.
s = Ex-dividend effect (market value of $1 in corporation bank account).
e = Market's valuation of $1 in earnings and profits (E & P) account.

alternatively in the form of a dividend or in the form of a repurchase of $1 worth of the company's stock from the shareholder.

The effect of both transactions is almost the same at the company level. The difference is in the tax-technical detail of the treatment of the company's accumulated "E & P" (earnings and profits) account. When the E & P account is exhausted, a dividend-style distribution is treated by the shareholder as a "return of capital," giving rise to a reduction in the shareholder's tax "basis" in the shares (roughly, the purchase cost of the shares, less any previous return of capital) and no current shareholder income tax.[1] In principle, therefore, a smaller earnings and profit account is a good thing, a small plus for the dividend form of distribution.

A noncorporate shareholder with marginal tax rate m nets $(1−m) from a $1 dividend and suffers a loss of $s in the value of his or her holding, the ex-dividend effect on the stock's price, a result of reducing the corporation's bank balance by $1. If, instead, the shareholder absorbs the $1 distribution via a sale of some of the stock, the net cash realized is reduced, not by the ordinary income tax rate, but by the capital gains tax. The latter is the capital gains rate times the difference between $1 and the shareholder's tax basis in the shares sold, denoted b in the table. Generally, b is greater than zero, and furthermore it used to be the case that the capital gains tax rate was substantially less than the ordinary income tax rate. There is a price to the shareholder, though, for this tax advantage, namely, the using up of some basis, which

[1] If the shareholder's basis is zero, then a "return of capital" is taxed in the same way as a dividend.

implies a possible increase in tax at some time in the future (unless the share is held until the owner's death). Because the thing the shareholders as a group continue to own after the distribution is almost the same, whether the cash flows out by dividend or by share repurchase, the "ex dividend" effect of the share repurchase should also be the same, namely $s. The tiny difference is in the decrement to the corporate E & P account associated with the dividend, and not with the share repurchase, shown in the table as an extra decrement of $e to shareholder wealth under the latter route.

In the typical case we can probably safely assume that the value of e is negligible because most large public corporations can expect never to reach the stage of exhausting their E & P accounts (and for that reason many have no reason to know and do not know their accumulated E & P). In many cases it is also reasonable to neglect the shareholder's basis reduction associated with share repurchase. Under these circumstances the advantage of the repurchase route over the dividend route is: $1-g(1-b) - (1-m)$, or $m - g(1-b)$. In the good old days, the marginal tax rate on ordinary income for a well-to-do shareholder was 50 percent; the marginal rate on capital gains was 40 percent of that on ordinary income: $g = .4m$. The basis in $1 worth of stock might commonly be fifty cents: $b = .5$. These figures imply that in the good old days the net advantage of the repurchase route was $0.42 per dollar distributed! For an average marginal tax rate of 0.2 instead of 0.5, the net advantage per dollar was still $0.17. When one considers that the economic effect of the two routes is *identical*, $0.42 or even $0.17 per dollar was a very substantial penalty to pay for using the traditional dividend method. Yet corporate dividends were, and still are, very substantial. That is the dividend paradox.

The point of this close exploration of the tax advantages of share repurchase over dividends as a method of distributing funds out of corporations is twofold: On the one hand, it illustrates the weakness of wealth-maximizing as a hypothesis upon which to base predictions of the effect of tax policy in the short run. On the other hand, corporate owners do appear to have slowly begun to adapt their actual policies to those that economics suggests are financially dominant. But the change is not by any means complete. Furthermore, by eliminating the rate differential between ordinary income and capital gains, the Tax Reform Act of 1986 sharply reduced (although it did not eliminate) the relative advantage of share repurchase. The lesson may be that the economic analysis does give good predictions over a long enough horizon, but that behavior will adjust slowly and with considerable inertia.

On the face of it, the tax changes in 1986 not only greatly reduced the incentive to use share repurchase (or cash acquisition of one corporation by another, about the same thing as share repurchase as a

way of avoiding dividend tax), they shifted the incentives in favor of debt over equity finance when the matter is viewed from the perspective of the well-to-do individual. Over a period of a decade or so, the marginal tax rate on interest received by such individuals fell from 70 percent to 28 percent, while the tax on equity return in the form of retained earnings dropped from 46 percent plus capital gains tax accrual of, say, 8 percent to 34 percent plus capital gains tax accrual of, perhaps, 9 percent. From an earlier comparison of 70 percent tax on interest and 54 percent on equity, the recent comparison is between 28 percent on interest and 43 percent on equity. As Auerbach points out, tax-exempt entities also hold significant amounts of equity; for them the rate differential has moved in the opposite direction. Interest receipts were and are taxed at 0 percent, whereas the rate of tax on equity has dropped from 46 to 34 percent.

Both of these are partial pictures, however, and neglect the role of inflation. Consider as an example of a corporate asset a machine that costs \$100 and yields \$5 per year in perpetuity. A corporation could borrow at 5 percent interest to buy such a machine and break even, with or without an income tax. By contrast, if it bought the machine outright and retained the earnings it would generate a yield of $(1-t)5$ percent, where t is the corporate tax rate and the individual shareholder level tax on capital gains is ignored. High-bracket individuals, with marginal rates above the corporate rate, would prefer equity to debt. Now introduce inflation at 10 percent per annum. Assuming (heroically) inflation-adjusted depreciation, the corporation's asset would continue to yield 5 percent in real terms before tax, $(1-t)5$ percent real after corporate tax. But the return on debt will now depend on the adjustment of the nominal interest rate. If it adjusts point for point with inflation (thus maintaining constancy in real terms exclusive of tax effects), interest will go to 15 percent. The real interest rate for a high-bracket taxpayer is now sharply negative (15 percent, less, say, 7.5 percent tax, less 10 percent inflation), and there is a strong incentive for high-bracket taxpayers to borrow. Indeed, there is money to be made by borrowing to buy equity, even if the real return from equity is also hurt by inflation (owing to inadequate correction of depreciation allowances). Once again, we have a story with incompletely worked out equilibrium implications, but it would seem that conditions of inflation would induce a shift of equity from low- to high-bracket taxpayers and probably a larger amount of equity overall. With the reduction of inflation rates in the later 1980s one would expect downward pressure on the stock of equity, and upward pressure on the stock of debt.

Since we do not know how equilibrium is determined we cannot be confident about the windfall effects of a program of dividend relief, stressed by Auerbach. Again, a simple example may help clarify the

problem. Suppose both high-bracket individual and corporate tax rates are 30 percent and capital gains are not taxed (because of deferral until death). Then, if the only way corporations can distribute to shareholders is in the form of dividends, we can imagine an equilibrium in which high-bracket individuals are indifferent between equity and debt and zero-bracket individuals (read pension funds) hold only debt. The equityholders are indifferent between "their" corporation's distributing an extra dollar in dividends and its retaining the dollar for distribution a year hence, after earning the going rate of interest (say, 10 percent) less corporate tax. This is because the dollar currently distributed yields the shareholder $0.70. Saved in the bond market for one period, the $0.70 becomes $0.70 x (1 + .10 x (1 − .30)). Alternatively, the dollar retained becomes $(1 + .10 x (1 − .30)) in the coffers of the corporation, which, when distributed, becomes 0.70 x $(1 + .10 x (1 − .30)) in the hands of the shareholders, after payment of dividend tax. The policies, "Distribute now" and "Retain and distribute next year," have the exactly the same consequences for high-bracket taxpayers.

To render this outcome consistent with equilibrium in the market for shares requires that the shares representing $1 inside the corporation be valued at $0.70. The difference between the two values is the dividend tax that has to be paid to get the money out of the corporation. In this situation, eliminating the dividend tax through dividend relief, while leaving the other taxes, would imply a jump in the value of shares by 30/70, or 43 percent. But note that if, instead, the value of shares is based upon the expectation that the funds can be gotten out of the corporation by share repurchase, much less of a discount will be predicted, and much less of a windfall effect of the shift to dividend relief.

Among the approaches to rendering the tax system neutral with respect to the financial structure of the corporate sector, the R-base corporate cash flow tax is certainly the most radical that Auerbach discusses. In my view, he understates the pressure that such a system would create if it were not coordinated with parallel changes in the individual income tax. Here, too, we have a structure of rules under which the usual economic models of the determinants of corporate investment and financial behavior have no equilibrium. The taxation of corporate equity investment would be effected through the realization-based capital gains tax only, while interest receipts would continue to be overtaxed (by virtue of no inflation adjustment). The corporate sector would become a vast tax shelter; high-bracket taxpayers would have strong pressures to borrow to buy equity.

Let me conclude with a less radical suggestion than Auerbach's for moderating the potential windfall gains from introducing an imputation credit on dividends (thereby moving toward neutrality with respect to

financial structure). The approach is suggested by Auerbach's discussion that relates the size of such gains to the amount of dividend tax that would be avoided on, in effect, undistributed earnings accumulated from the past. The trick would be to use the existing tax concept of accumulated corporate earnings and profits (E & P) that is the operational counterpart to undistributed earnings accumulated from the past. Under current rules, this tax account is incremented each year by that year's corporate E & P (which are more broadly defined than taxable income) and decremented by dividends paid. The suggestion is simply to discontinue the addition of earnings to a corporation's E & P account, and treat what we now call dividends (that is, payments out of accumulated E & P) just as we do now. An imputation credit would apply only for distributions that we would now call a return of capital. Recognizing that such an approach would invite many refinements (for example, to reduce a continuing incentive to postpone dividends by making distributions to shareholders through share repurchase), it would take advantage of familiar tax concepts and would probably appear much less academic than a onetime windfall tax.

If these remarks and Auerbach's paper give the impression of a most uncomfortable state of knowledge about corporate income taxation, and about the taxation of capital income more broadly, I do not think the reader is being misled. We live in a system in which the writers of tax law seem to be driven by the requirements of staying ahead of the ingenuity of financial technicians. In my view, approaches are available to us to move toward logically consistent rules that are vastly simpler than the evolving legal tangle that Auerbach analyzes. The key to a tax system that might hold still is uniformity of the tax treatment of both sides of what we think of as capital income transactions, including the applicable tax rate. But, obviously, that would take the fun out of tax analysis and would be the subject of another paper.

Discussion

*Emil M. Sunley**

Alan Auerbach has provided a comprehensive survey of a very complex field. The first part of his paper focuses on the role tax factors may have played in the recent surge in corporate borrowing. I agree with his major conclusion that changes in tax incentives are not the primary cause of the shift toward debt and that the social costs of increased borrowing may have been overstated. One factor that may have contributed to the increased corporate borrowing, not discussed by Auerbach, is the development of a market for high-yield, low-grade corporate bonds; that is, a market for so-called junk bonds. It is only in recent years that large publicly traded corporations have learned that they can issue low-grade subordinated debt.

A tax factor that may have contributed to the surge in corporate borrowing is the expansion of the tax base as a result of the 1986 cutback in tax preferences. For example, the repeal of the investment tax credit permits companies to absorb more interest deductions.

What I want to focus on is the second part of Auerbach's paper: the review of alternative tax reform proposals to reduce the disparities in the tax treatment of debt and equity.

Integration

One of the most significant trends in tax policy in recent years has been the movement in national tax structures from classical systems,

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with separate taxation of corporations and their shareholders, towards some form of integration of corporate and shareholder taxation with respect to distributed corporate profits. This trend has grown out of an increasing concern over the impact of the double tax burden that the classical system places on income from capital in the corporate sector.

The double taxation of corporate profits, once at the corporate level and again at the shareholder level, creates three types of distortions that reduce the efficiency of capital markets. First, the classical system distorts the allocation of capital between the corporate and the noncorporate sectors. Second, it encourages corporations to retain their earnings in order to avoid the double taxation of dividends. Third, it encourages the use of debt finance because interest payments are deductible for tax purposes and dividends are not. The integration of individual and corporate taxes would reduce these distortions and would thereby increase economic efficiency.

Although it is recognized that a movement towards corporate integration would improve the allocation of capital, it is not clear that it would increase the level of investment. The major concern is that corporate integration would reduce the "tax" on distributions and thereby encourage additional distributions, reducing business savings. Unless savings of individuals increased, total savings would be reduced.

The United States has not adopted a form of dividend relief primarily because business has offered very little support for such proposals. Business opposition to integration is due to the fact that the benefits of integration are spread very unevenly across industries and across firms within an industry. Integration would provide little or no benefit to small closely held companies, which currently pay little in dividends. Integration would also not benefit rapidly growing or high technology firms, which also pay little in dividends. The utility companies are concerned that integration, particularly the dividends-paid deduction variety, would be treated for utility rate-making purposes as a reduction in the corporate tax, resulting in the benefits of integration being immediately passed through to customers. Large multinational companies that pay substantial foreign taxes but little in U.S. taxes would also not benefit from the proposals, since it is unlikely that the Administration or the Congress would support an integration proposal providing a credit at the shareholder level unless taxes had actually been paid to the U.S. government at the corporate level. Finally, some academics are concerned that dividend relief would provide an unwarranted windfall for old capital.

The choice between the shareholder credit and a dividends-paid deduction hinges on some subtle issues. The shareholder credit looks like individual tax relief, while the dividends-paid deduction looks like corporate relief. The two approaches can be made equivalent if the same

level of dividend relief is provided. If cash dividends are sticky in the short run, the dividends-paid deduction increases corporate cash flow and the shareholder credit increases the cash flow of the shareholders. Also, it is easier to deny the relief to tax-exempt shareholders and foreigners if the relief takes the form of a shareholder credit rather than a dividends-paid deduction.

The American Law Institute proposal described by Auerbach deals with the windfall problem by limiting dividend relief to new equity and by restricting the ability of firms to make tax-favored non-dividend distributions. One problem with this proposal is that Congress might take the stick and not the carrot.

No country has adopted a system of full integration of the corporate and individual taxes where the corporate income is imputed to the shareholders whether it is distributed or not. Full integration, compared to partial integration, would put less pressure on increased distributions since the tax relief from the "double tax" is not triggered when distributions are made. Compared to the classical system of taxing corporations and individuals, however, full integration would increase the pressure to pay out dividends since under the classical system, dividends trigger the second tax.

As Auerbach points out in his paper, the technical problems of full integration have not yet been fully worked out. I believe that most of the complexity could be logged at the corporate level if the corporate tax is retained as a withholding tax. Two particularly difficult areas in a full integration proposal are the treatment of tiers of corporations and how to handle companies with multiple classes of stock.

Cash Flow Tax

A corporate cash flow tax would also eliminate bias between debt and equity. A movement to a corporate cash flow tax involves significant transition problems. How should old investments be treated? How should old debt be treated? There are no easy answers. If, for example, companies are permitted to expense new investments while at the same time continuing to write off old investments, the tax base will shrink significantly. On the other hand, to go cold turkey and deny any further write-offs on old investments would penalize companies that made very large irregular investments just before the switch to the cash flow tax.

Blueprints suggested that the transition problem be handled by requiring taxpayers, for a period of ten years, to compute their tax under the old and new laws and pay the higher of the two computed taxes. This approach avoids significant revenue loss during the transition, but

the simplicity gains from a cash flow tax would be dissipated if the old law is retained for ten years.

The international implications of introducing a cash flow tax also are troublesome and have no easy solutions. If the United States adopts a pure corporate cash flow tax, a significant amount of tax revenue would be transferred from the United States to any home country that continues to rely on income taxes. This problem was recognized by the Meade Commission. The solution was to impose a special withholding tax on dividends paid to foreigners. The purpose of this withholding tax would be to soak up the allowable foreign tax credit in the home country, so that no residual tax would have to be paid in the home country. It is not at all clear whether the regular cash flow tax or the special withholding tax would be creditable against the home country's income tax. The withholding tax would violate the nondiscrimination provisions of existing tax treaties.

Conclusion

In 1986, Congress rejected any fundamental change in the way the United States taxes corporations and shareholders. Since then, the wave of corporate mergers and reorganizations and the surge in corporate debt have rekindled interest in reducing or removing the bias against corporate equity. Auerbach provides a very able survey of the issues surrounding any fundamental change in the tax treatment of corporations and shareholders.

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Regulation of Debt and Equity

*Richard W. Kopcke and Eric S. Rosengren**

At the heart of economic development and capital formation is the transfer of resources from those who would save to those who would invest. When the capacity to accomplish these transfers efficiently is lacking, growth is impaired, and less profitable investments may displace some that are more promising. In the United States, much of this transfer of resources flows through a nexus of financial markets and institutions. Banks, insurance companies, pension funds, savings and loan associations, and other financial intermediaries fill an important role in this financial system by offering savers an attractive means of accumulating claims while offering investors attractive terms for accepting claims. Without these intermediaries, each financial contract must accommodate at once the specific, often incompatible motives of savers and investors. For example, households seeking relatively liquid assets or insurance coverage might find little common ground with businesses seeking financing for factories. Consequently, the evolution of our financial system is guided, to a great degree, by the opportunity for profit which attracts enterprises that either would match savers with investors of complementary interests or would mediate the distinct interests of savers and investors, converting the primary securities issued by investors into assets valued by savers.

The features of our financial system are shaped by public controls and subsidies, as well as by the various motives of savers and investors. Financial transactions allocate the risks as well as the returns of the

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underlying investments, not only among the parties to those transactions but also among others. The design of these arrangements also may either diminish or increase the total risk posed by uncertain investments to the economy. Because of agency costs, externalities, and competitive pressures, financial transactions may impose unacceptable risks on the economy without offering adequate compensation. Accordingly, the regulation of securities offerings, the conventions governing markets, and the regulation of intermediaries may control the risks created by these contracts. These regulations, by design, influence both the volume of financial transactions and the means by which funds flow from savers to investors.

The goal of policy is to foster contracts that allocate risks and returns in an acceptable fashion without arbitrarily impeding the efficient transfer of resources. In order to meet this goal, private and public regulations must change with economic conditions as well as the motives of savers and investors, so that the allocation of risks and returns remains appropriate. Otherwise, the cost of these regulations may exceed their benefits.

This paper concludes that the regulations governing financial intermediaries promote debt financing by businesses. Savers are attracted to the insured and guaranteed liabilities issued by intermediaries, who, in turn, place these funds mainly in new debt securities. Although regulations allow some intermediaries such as pension funds and insurance companies to buy stock, these intermediaries tend to acquire the existing equity of established corporations, not the newly issued equity of developing enterprises. Regulations that restrict intermediaries from holding equity may tend to make the economy less stable by dividing the interests of investors from those of intermediaries and by encouraging intermediaries to hold riskier debt in order to earn a competitive rate of return on their capital. Instead of emphasizing restrictions on assets, often favoring debt over equity, regulators should rely on capital controls by enforcing substantial minimum capital requirements, to be financed by common stock.

While equity is inherently riskier than debt, public policy does not necessarily promote financial security or economic stability by requiring intermediaries to acquire debt rather than equity interests. With such an emphasis on debt, the cost of equity financing may be relatively great and relatively volatile, especially for developing enterprises that are not well-known in capital markets. Furthermore, by dividing the interests of investors from those of their "bankers," such restrictions encourage intermediaries to supply less credit or seek premature repayment on projects whose prospects appear to dim. Financial intermediaries exist to bridge the differences between the motives of savers and those of investors. When regulations sharpen the distinctions between the

incentives of entrepreneurs and the incentives of those financing investments, economic activity and the prices of assets may become less stable as opinions change about the future returns on investment projects.

The first section of this paper describes the role of banks, pension funds, life insurance companies, and other intermediaries in transferring funds from savers to investors. During the past three decades, households essentially have been exchanging equities for deposits, insurance policies, or annuities. In this volume, Merton argues that financial intermediaries can repackage debt and equity of firms to satisfy investor demand. This may be prevented if financial intermediaries have a limited capacity for acquiring equities, especially those of developing enterprises. This change in the composition of households' financial wealth tends to diminish the supply and increase the relative cost of equity financing.

The second section describes the risks created by financial intermediation. By reshaping rather than eliminating risks and by reducing the rate of return on equity of regulated financial institutions, thereby making them less competitive with unregulated enterprises, existing regulations do not necessarily make financial intermediaries secure. Furthermore, by insuring or guaranteeing the liabilities of qualifying intermediaries or investors, the government tends to commit itself to maintaining the values of many assets, thereby constraining the options of macroeconomic policymakers.

The model in the third section describes the influence of regulations on an intermediary's behavior. Banks covered by deposit insurance are encouraged to make loans with lower expected returns and greater probabilities of default than they would otherwise. Binding capital requirements can foster this disposition. To the degree that regulators are not privy to the risks inherent in banks' loans, restricting the types of assets that banks can acquire may not reduce the risks that they bear very substantially.

The Flow of Funds from Saving to Investment

In accumulating wealth, households forgo current consumption in favor of increasing their opportunity for future consumption. This saving comprises investing directly in capital goods (homes, plants, durable equipment), acquiring the primary securities of others who invest in capital goods (loans, commercial paper, bonds, stock), or purchasing the indirect securities of intermediaries who, in turn, acquire either primary securities (deposits, annuities, insurance policies) or capital goods. While households directly control the disposition of much of their saving, some is undertaken on their behalf by businesses and

intermediaries that retain a portion of their earnings in order to finance new investments.

Most of households' saving each year is invested in capital goods. Purchases of consumer durables and residences amount to about 20 percent of disposable income, while the acquisition of financial assets has averaged just over 10 percent of income (table 1). Because those households purchasing capital goods ordinarily finance their investments partly by tapping the savings of other households, net saving amounted to just over 20 percent of disposable income during the last four years, while net financial saving was only about 4 percent of income.[1]

The Composition of Financial Saving

In principle, both the volume of households' saving and its allocation depend on the opportunities and services offered by the various financial assets. Some assets are attractive because they are safe, insured, or liquid; others appeal, despite their greater risks, because they offer some chance of extraordinary returns; the stream of payments offered by other assets coincides closely with the timing of future expenditures anticipated by savers; still other assets offer insurance against misfortunes; and, when "outsiders" do not understand fully investors' opportunities and motives, savers also value those financial arrangements that encourage investors to divulge information or to respect the interests of savers.

Although the acquisition of both primary and indirect assets has been an important means of saving throughout our history, the composition of household portfolios has been shifting to favor indirect securities over primary securities (tables 1 and 2). Banks, insurance companies, pension funds, and other intermediaries have introduced convenient products that, as surrogates for stocks and bonds, apparently remove some of the hurdles that deter savers, as outsiders, from financing investors. Altogether, the indirect securities issued by intermediaries rose from approximately 20 percent of household financial wealth earlier this century to about 50 percent today.

Since the 1950s, the subsidence of primary securities in households' financial wealth has been due entirely to savers' shifting their financial assets from equity toward other securities. Equity in corporations and partnerships formerly accounted for almost 60 percent of the portfolio;

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[1] This net financial saving corresponds most closely, but is not identical to, the concept of household saving in the national income and product accounts.

Table 1
Composition of Household Saving

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Percent of Disposable Income:											
Gross Purchases of Real Assets and Financial Assets	19.4	20.6	24.1	25.6	29.6	28.9	29.5	30.9	33.9	30.9	32.9
Gross Purchases of Real Assets	10.0	10.8	15.6	15.6	20.4	18.6	18.4	18.2	19.6	17.5	19.8
Purchases of Financial Assets	9.3	9.8	8.5	9.9	9.2	10.3	11.0	12.7	14.2	13.4	13.1
Percent of Purchases of Financial Assets:											
Primary Securities	69.5	78.2	48.2	107.5	21.9	9.9	18.8	−2.0	1.0	−3.0	5.1
Equity	50.2	46.0	55.3	75.8	−1.0	−2.5	−7.4	−10.5	−20.5	−32.5	−27.5
Corporate Equity	19.7	28.4	26.3	57.9	3.9	−1.9	−5.6	−1.9	−6.7	−9.5	−23.9
Noncorporate Equity	30.5	17.6	29.0	17.8	−5.9	−1.6	−3.3	−7.0	−15.7	−25.5	−18.3
Debt Securities	19.3	32.2	−7.1	31.7	23.9	13.4	27.7	6.9	23.5	32.0	47.3
U.S. Government Securities	−3.4	.1	−45.6	−4.5	5.6	1.6	10.0	−1.9	11.2	17.5	22.6
Indirect Securities	30.5	21.8	51.8	−7.5	76.8	88.7	78.7	99.5	96.0	100.5	88.8
Deposits	21.2	16.0	39.2	−18.3	42.3	55.9	47.3	66.0	55.9	54.3	37.7
Pension Fund Reserves	0	0	.2	−1.6	23.6	23.4	23.4	27.4	35.3	43.5	46.9
Life Insurance Reserves	9.3	5.8	12.4	12.5	10.9	9.4	7.9	6.2	4.8	2.7	4.2
Percent of Disposable Income:											
Increase in Liabilities	1.7	1.4	3.1	1.9	5.5	5.7	5.2	5.9	8.6	6.6	9.2

Notes: For tables 1 and 2, real assets include residential structures, consumer durables, and nonprofit plant and equipment. Corporate equities include all corporate equities held directly by households and equities held indirectly in mutual funds. Debt securities include U.S. Government securities, tax-exempt obligations, open market paper, mortgages, corporate bonds, and securities credit held directly by households as well as credit market instruments held indirectly through mutual funds or money market mutual funds. Deposits include all checking, savings, and time deposits held directly by households as well as credit market instruments held indirectly through mutual funds or money market mutual funds.

Source: Disposable income 1900 to 1929, U.S. Department of Commerce, *Historical Statistics of the United States*, p. 139. All other data 1900 to 1929, Raymond W. Goldsmith, 1956. *A Study of Saving in the United States*, vol. I, p. 365. All data 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*.

Table 2
Composition of Household Assets

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Percent of Total Assets:											
Real Assets	48.5	41.4	40.7	36.6	31.2	30.0	29.7	33.4	37.4	36.5	34.8
Financial Assets	51.5	58.6	59.3	63.4	68.8	70.0	70.3	66.6	62.6	63.5	65.2
Percent of Financial Assets:											
Primary Securities	80.9	78.9	76.1	77.7	69.9	67.4	64.8	59.3	55.4	56.1	52.4
Equity	54.4	55.6	49.3	58.6	58.5	57.1	55.4	50.2	46.2	45.7	40.2
Corporate Equity	33.7	42.4	34.8	48.4	27.9	30.8	32.2	25.4	16.4	16.3	17.4
Noncorporate Equity	20.8	13.2	14.5	10.2	30.4	26.1	23.0	24.5	29.6	29.1	20.9
Debt Securities	26.4	23.3	26.8	19.2	11.5	10.5	9.7	9.4	9.4	10.7	14.1
U.S. Government Securities	1.8	.6	6.2	1.4	6.3	4.9	4.2	3.5	3.7	5.0	7.0
Indirect Securities	18.8	20.2	21.4	19.1	29.1	31.6	34.2	39.6	43.4	42.8	46.1
Deposits	14.4	15.0	16.3	12.9	17.0	18.4	20.3	24.0	26.1	24.1	23.8
Pension Fund Reserves	0	0	.2	.7	5.6	7.3	8.6	10.6	13.1	15.6	19.7
Life Insurance Reserves	4.3	5.2	4.9	5.6	6.5	6.0	5.3	5.0	4.2	3.1	2.6
Percent of Total Assets:											
Total Liabilities	8.6	8.1	8.3	11.3	10.3	12.1	13.2	14.0	14.5	14.6	16.8

Source and Notes: See table 1.

today its share is approximately 40 percent. Even though equities represent the single most important asset in households' financial wealth, these securities, which tend to be held by a very few of the most wealthy households, have played a relatively modest role in transferring resources from savers at large to investors. Instead, equity generally represents the cumulative value of investors' retained earnings in their own enterprises.

Of the remaining financial assets, bank deposits, pension fund obligations, primary debt securities (mostly government debt), and the obligations of life insurance companies occupy the largest share of households' wealth. Bank deposits (comprising the accounts of commercial banks and thrift institutions) are held by most households, representing the broadest source of new funds for investors. Although these deposits have accounted for an increasing share of households' financial wealth, they are not growing as quickly as the reserves of pension funds (comprising the reserves of private pension plans and state and local government retirement funds), the third largest component of wealth. Because many employers and households participate in pension plans, these intermediaries also represent a broad source of funds for investors. Life insurance reserves today account for only 3 percent of households' financial assets, less than one-half their share of the 1950s.

The Composition of Financing for Investors

Businesses may finance their investments either with internal funds (retained earnings), which are equity, or with external funds, which may be either equity or debt. Since the 1950s, external funds have provided at least 60 percent of the financing of nonfinancial corporations (table 3), and, following a familiar historical pattern, debt accounted for more than 85 percent of this external funding.[2] After deducting capital consumption from equity, debt accounted for almost 60 percent of the financing of net investment by nonfinancial corporations from the 1950s to the 1980s.

The relative stability of corporations' ratio of debt to assets, compared to the substantial volatility in their sources of funding, suggests

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[2] Goldsmith 1955, 1973; Navin and Sears 1955; Taggart 1986; Baskin 1988; Kopcke 1989b. Although these figures suggest that nonfinancial corporations relied on equity financing more during the first 30 years of this century than they have subsequently, these estimates probably overstate the contribution of new equity issues. Flow of funds accounts include the initial public offerings of established proprietorships and partnerships that convert to corporations. Such conversions were more significant during the early twentieth century than they have been since 1940. Furthermore, before 1930, much of the new equity was issued by one corporation to acquire the outstanding equity of another, the value of which is not subtracted from new equity issues in Goldsmith's data.

Table 3
Financing of Nonfinancial Corporate Business

	1901–12	1913–22	1923–29	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Percent of Total Sources of Funds:										
Net Equity Financing	53.7	56.7	58.1	47.7	48.9	41.6	31.7	39.7	25.3	−6.5
Debt Financing	46.3	43.3	41.9	52.3	51.1	58.4	68.3	60.3	74.7	106.5
External Financing	45.0	40.0	45.0	60.6	54.3	60.6	77.9	64.8	73.3	59.9
Percent of External Financing:										
Equity Issues	31.1	27.5	42.2	14.1	5.6	3.5	12.7	8.7	−3.4	−78.7
Debt Issues	68.9	72.5	57.8	85.9	94.4	96.5	87.3	91.3	103.4	178.7
Percent of Total Assets:										
Real Assets	63.7	63.5	58.4	73.2	71.8	71.1	71.6	74.6	74.6	72.4
Financial Assets	36.3	36.5	41.6	26.8	28.2	28.9	28.4	25.4	25.4	27.6
Equity Financing	50.0	59.2	59.4	65.9	63.1	59.5	59.9	66.5	67.3	60.3
Debt Financing	50.0	40.8	40.6	34.1	36.9	40.5	40.1	33.5	32.7	39.7
Percent of Debt Financing:										
Credit Market Instruments	63.1	49.1	54.2	62.2	64.6	64.3	66.0	69.4	64.9	68.0

Note: Balance sheet items for 1900 through 1929 are for the end year of each period rather than a period average.

Source: Data for 1900 to 1929, Raymond W. Goldsmith, 1973, *Institutional Investors and Corporate Stock—A Background Study*, p. 42. Data for 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*.

that corporations choose their financing in order to manage their degree of leverage.[3] If, at any time, one blend of debt and equity financing is preferable to others and if this optimal blend varies with the cost of obtaining debt versus equity financing, then the terms under which financial intermediaries obtain funds and the terms under which they are willing or able to advance funds will influence both the choice of leverage by businesses and their rate of investment (Gurley and Shaw 1955, 1956, 1960; Brainard and Tobin 1968; Tobin 1969, 1982).

Because intermediaries, such as banks, insurance companies, and pension funds, occupy an increasingly important role in supplying businesses with external funds, their willingness or ability to supply equity versus debt financing influences the financial structures of businesses and their cost of capital. While most intermediaries acquire considerable amounts of debt (tables 4 and 5), few hold significant amounts of equity (tables 4 and 6). Most intermediaries, including the important banking enterprises, by regulation or custom essentially hold no equity other than that of their related enterprises. Insurance companies and the rapidly growing pension funds together have obtained their equity on secondary markets from households, which have been liquidating their positions since the 1950s (table 1). Accordingly, the acquisition of equity by insurers and pension funds seldom supplies new financing directly to corporations.[4]

Because the major source of new equity financing for businesses has been retained earnings, many rapidly growing firms that are not well-known in capital markets often turn to other "nonfinancial" corporations for funds, frequently leading to mergers and acquisitions. Moreover, trade credit extended by nonfinancial corporations (not including consumer credit or loans by subsidiary finance companies) in 1988 amounted to 10 percent of their total assets or almost 40 percent of their financial assets.[5] The financial office of a business that can obtain ample financing at favorable terms is itself a potential financial intermediary.

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[3] Although the Modigliani-Miller theorem and some of its refinements suggest that leverage may be immaterial for a corporation (Taggart 1985), when capital markets are not perfect or returns are diminishing, the choice of leverage may become important (Navin and Sears 1955; Jensen and Meckling 1976; Baskin 1988; Kopcke 1989a, 1989b).

[4] Stock markets provide shareholders a convenient means of liquidating their stakes. This opportunity may indirectly finance capital formation by encouraging entrepreneurs or venture capitalists to invest in growing enterprises. This pattern of financing depends on the motives and regulations governing investors as well as those influencing intermediaries and savers (see footnote 3).

[5] The trade credit reported as a liability of nonfinancial corporations in 1988 was about one-fifth of total liabilities (other than equity), an amount that exceeded bank loans to these corporations and which equaled six-tenths of the face value of corporate bonds.

Table 4
Composition of Assets of Financial Intermediaries
Percent of Total Assets

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Commercial Banking											
Capital-Asset Ratio	19.4	18.5	13.0	13.8	7.7	8.0	7.9	8.1	7.4	7.1	6.2
Corporate Equity	1.0	1.3	1.1	1.8	0	0	0	0	0	0	0
Debt	91.9	94.7	91.7	88.8	86.7	88.5	89.3	86.7	84.6	83.0	81.9
Thrifts											
Capital-Asset Ratio	22.7	24.8	34.4	47.1	7.7	7.5	8.1	6.6	5.9	4.6	4.8
Corporate Equity	1.5	.8	.5	.4	1.2	1.0	1.0	1.0	.7	.3	.4
Debt	93.6	97.2	97.1	96.2	93.0	92.3	92.1	92.1	91.8	89.0	87.7
Pension Funds											
Corporate Equity	0	0	20.0	20.0	24.0	33.9	41.7	47.1	40.2	39.6	43.6
Debt	0	0	80.0	80.0	73.5	63.6	54.9	47.8	50.4	52.7	51.2
Life Insurance Companies											
Capital-Asset Ratio	14.3	12.0	8.2	7.6	12.0	12.8	13.3	12.5	11.5	10.9	9.5
Corporate Equity	5.5	2.2	.6	2.4	3.8	4.8	6.2	9.3	9.6	9.4	9.4
Debt	74.5	89.2	91.5	89.8	90.2	88.6	87.0	82.9	81.8	80.0	79.7
Other Insurance Companies											
Capital-Asset Ratio	49.8	39.8	29.4	30.2	40.6	41.8	36.7	31.6	25.2	25.7	24.7
Corporate Equity	23.5	19.5	12.3	21.4	27.6	30.3	30.9	26.5	16.1	18.7	17.6
Debt	46.5	59.6	73.7	66.5	71.7	69.3	68.2	71.6	82.3	79.9	81.5
Investment Trusts											
Corporate Equity	0	0	62.7	73.3	87.3	86.2	84.0	58.2	58.1	57.1	33.4
Debt	0	0	34.5	24.0	12.7	12.4	13.6	34.8	35.3	35.3	48.8
Security Brokers and Dealers											
Capital-Asset Ratio	27.3	30.0	29.0	28.9	2.4	3.7	5.6	10.0	16.7	15.0	18.0
Corporate Equity	9.1	10.0	7.2	8.6	11.8	5.6	11.0	12.0	8.0	7.4	8.4
Debt	90.9	90.0	92.8	91.4	88.2	94.4	89.0	88.0	84.1	78.4	72.5

Distribution of Assets among Financial Institutions Percent of Total Assets of Financial Institutions											
Commercial Banking	63.6	65.4	65.5	54.0	44.2	39.8	39.9	41.6	39.8	36.9	33.4
Thrifts	18.6	14.9	13.0	14.3	16.5	19.3	19.3	19.7	21.5	19.4	18.3
Pension Funds	0	0	.1	.4	7.6	10.0	11.6	12.4	14.3	16.4	16.8
Life Insurance Companies	11.1	13.2	12.0	14.4	19.7	17.8	15.6	13.2	11.9	11.4	11.3
Investment Trusts	0	0	.2	2.5	2.1	3.1	3.9	3.4	2.0	1.9	5.7
Finance Companies	0	0	0	2.0	4.0	4.3	4.4	4.5	4.6	4.7	4.8
Other Insurance Companies	3.3	3.5	4.4	6.2	4.7	4.6	4.1	4.1	4.4	4.4	4.5
Money Market Mutual Funds	0	0	0	0	0	0	0	0	.4	3.4	3.4
Security Brokers and Dealers	3.5	3.0	4.8	6.3	1.1	1.1	1.2	1.1	1.0	1.5	1.8

Notes: In calculating capital-asset ratios, data on real assets for commercial banks from 1984 to 1988 are for FDIC-insured banks only. Thrifts includes savings and loans, mutual savings banks, and credit unions. Credit unions are included in the capital-asset ratio only from 1972 to 1988. Investment trusts includes REITs, CMOs, and mutual funds. All data for 1900 to 1929 are from Raymond W. Goldsmith, 1958, *Financial Intermediaries in the American Economy Since 1900*. Data on total assets for banks are from the Federal Deposit Insurance Corporation, *Annual Reports*, and *Statistics on Banking*. Data on total assets for life insurance companies are from the American Council on Life Insurance, *Life Insurance Fact Book*. Data on total assets for other insurance companies are from *Best's Aggregates and Averages for the Property-Casualty Insurance Industry*. Data on total assets for savings and loan companies are from the Federal Savings and Loan Corporation, unpublished data. Data on total assets for credit unions are from the National Credit Union Administration, unpublished data. Data on total assets for REITs are from the National Association of Real Estate Investment Trusts, unpublished data. All other data are from the Board of Governors of the Federal Reserve System, *Flow of Funds*.

Table 5
Holders of Equity
Percent

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Households	96.8	97.8	97.9	96.1	91.4	88.4	85.4	79.2	73.5	72.0	68.3
Pension Funds	0	0	0	.1	2.6	4.7	6.7	11.5	17.1	19.0	20.8
Investment Trusts	0	0	.1	1.4	2.6	3.7	4.5	4.4	3.4	3.1	5.2
Life Insurance Companies	.5	.3	.1	.2	1.1	1.2	1.3	2.5	3.4	3.1	3.0
Other Insurance Companies	1.0	.7	.6	1.0	1.7	1.7	1.6	1.8	1.8	2.2	2.1
Banking	1.2	1.0	.9	.8	.3	.3	.3	.4	.5	.2	.2

Source: Data for 1900 to 1929, Raymond W. Goldsmith, 1956, *A Study of Saving in the United States*, pp. 61–91. Data for 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*.

Table 6
Holders of Debt of Nonfinancial Sector
Percent

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Banking	30.5	35.0	32.4	31.8	39.6	42.3	43.1	45.8	46.8	42.5	39.9
Households	35.6	35.6	39.2	35.8	20.0	17.8	15.1	13.0	11.9	12.0	12.5
Business	27.1	20.1	18.7	17.5	16.5	15.1	14.3	14.3	12.9	12.8	11.0
Life Insurance	4.4	6.8	5.8	7.9	13.7	13.0	11.3	9.5	8.5	8.0	8.2
Federal Government	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4.2	4.9	6.0	7.1	7.7
Pension Funds	0	0	0	.2	4.2	5.1	5.2	4.9	5.7	6.8	6.9
Finance Companies	0	0	0	1.1	2.9	3.4	3.6	3.8	3.9	4.2	4.4
Investment Trusts	0	0	0	.1	.2	.3	.4	.8	.8	2.7	5.1
Other Insurance Companies	.9	1.2	1.6	2.5	2.2	2.2	2.0	2.1	2.7	2.8	3.1

Notes: Banking includes commercial banks, savings and loans, mutual savings banks, and credit unions. Business includes corporate and noncorporate business. Investment trusts includes CMOs, REITs, mutual funds, and money market mutual funds.

Source: Data for 1900 to 1929, Raymond W. Goldsmith, 1956, *A Study of Savings in the United States*, pp. 61–91. Data for 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*. Data on federal debt holdings, Office of Management and Budget, *Special Analysis: Budget of the U.S. Government*.

The federal government also is a financial intermediary. Aside from offering considerable health and retirement benefits to households, which pay "premiums" in the form of payroll taxes, the government and its sponsored enterprises hold almost 8 percent of the debt issued by nonfinancial sectors (table 6), while guaranteeing the outstanding balance on another 6 percent of the debt issued by households and businesses. Altogether, the government directly or indirectly insures about one-half of the debt of households and businesses through these loans, guarantees, and the insuring of bank deposits and pension plan obligations.

Risk and Regulation

A bank may offer deposits with little risk by running a "matched book": the characteristics of deposits are matched closely with those of assets. If intermediaries did little more than run matched-book mutual funds, then the economy would have advanced little beyond the stage where savers seeking liquid deposits and insurance found little in common with investors wanting to finance new factories. For most savers, the appeal of indirect securities issued by intermediaries is greater than that of primary securities, partly because intermediaries bear risks by transforming the properties of primary securities into those more attractive to savers. Financial intermediaries also serve savers and investors by evaluating investors' prospects, monitoring their performance, and providing them a relatively dependable access to funds on terms commensurate with their risk and returns.[6]

Deviating from a matched book creates risk. But, in doing so, intermediaries might increase their return on assets, the yields they offer depositors, and their profits; they also might offer funds to investors on better terms than otherwise possible. To a degree, a good reputation, a secure money market, and some ability to sell assets mitigate the risk of an unbalanced book, but the system as a whole is vulnerable should the motives of savers not match those of investors very closely (Keynes 1936; Minsky 1985). Intermediaries bear a considerable risk of insolvency or eventual illiquidity, for example, to the degree the redemption values of their liabilities do not match those of their assets.[7] Most households'

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[6] See Gurley and Shaw (1955, 1956, 1960); Jensen and Meckling (1976): Leland and Pyle (1977); Smith and Warner (1979); Diamond and Dybvig (1983); Diamond (1984); Fama (1985); Bernanke and Gertler (1987); Gertler (1988); and Hoshi, Kashyap, and Scharfstein (1989).

[7] During the late 1970s and 1980s, savings and loan associations gradually became illiquid and insolvent, even though the book value of their assets exceeded their liabilities

financial assets are of "guaranteed" principal, while the value of capital goods is never "guaranteed."[8]

Risks Inherent in Intermediation

By bearing the risk of a mismatched book, financial intermediaries essentially reduce the difference between the price savers ask and the price investors bid for financial resources. As long as intermediaries fully recognize the consequences of this risk, their activities may facilitate efficient capital formation. But intermediaries may not bear the full risk inherent in their activities for at least three reasons. First, because of agency costs, the owners and managers of intermediaries have an incentive to acquire relatively risky assets and to finance their assets with relatively little of their own equity. Second, some of the risk created by intermediaries is borne by the economy at large. Third, intermediaries may be prone to "winner's curses."

The owners of any enterprise financed partly by "debt" (defined claims as opposed to the residual claims of equity) have an incentive to promote the value of their own interests at the expense of customers and creditors by making relatively risky investments or relying on relatively little equity financing (Jensen and Meckling 1976; Galai and Masulis 1976). This potential agency cost becomes especially great when creditors lack sufficient information about the characteristics of the enterprise's assets. Consequently, this cost may be considerable for intermediaries that exist partly because of savers' unfamiliarity with investors' offerings. To the degree intermediaries are willing to accept relatively risky assets, they, in turn, will tolerate greater leverage on the part of investors to whom they offer financing.

When intermediaries, especially depository institutions, encounter hardships, they may trigger panics, runs, or withdrawals, which can threaten customers of other intermediaries with capital losses and retard economic development (Bernanke 1983; Calomiris and Hubbard 1989; Diamond and Dybvig 1983; Gertler 1988). Each financial intermediary ordinarily considers only the risks and returns borne by the parties to its

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for much of this time, because the characteristics of their liabilities did not match those of their assets. They borrowed short while lending long, and the value of the real estate backing their deposits collapsed. The risk of illiquidity or insolvency arises whenever changes in yields or relative prices influence assets differently from liabilities.

[8] In 1988, the tangible assets of households and nonfinancial corporations, which back their financial assets, were about $11 trillion. Land and structures represented more than one-half of this sum. Much of the remainder was durable equipment whose gross returns would "liquidate" its value only over several years. On the other hand, most of the financial assets that ultimately finance these tangible assets are deposits, short-term securities, or defined-benefit pension and insurance contracts.

contracts, instead of those borne by the entire economy. Consequently, some activities that pose high but acceptable risks for the intermediary and its customers may pose unacceptably great risks for society.

Finally, a winner's curse may tempt intermediaries to commit too many funds to the latest fad, paying relatively high prices for risky assets. As a consequence of the laws of probability and familiar waves in the pattern of economic development, at any time some assets will boast a recent record of consistently high returns with little apparent risk. Intermediaries holding these assets are more profitable than their competition. An overly optimistic assessment of the opportunities offered by these assets coupled with the desire to remain competitive and to appear in step with current opportunities can encourage many intermediaries (as well as savers and investors) to bid too aggressively for these assets, perhaps accepting too great a degree of leverage borne by investors (Keynes 1936; Thaler 1988). Ultimately, intermediaries can pay an excessive price, thereby accepting an inadequate return, given the risks inherent in these assets.

Deposit Insurance

Society may control the risk of runs by insuring bank deposits, annuities, or pension plans, but doing so increases the agency costs of intermediation. Although these agency costs are present even without insurance, such guarantees make savers less critical and reduce the cost of an intermediary's reliance on debt financing. These guarantees, for the same reasons, also may increase the degree of intermediation, reduce the cost of capital, and increase savers' acquisition of debt instruments.

Deposit insurance may be either explicit or implicit. Qualified accounts in banks and many pension plans are insured by government agencies to which these intermediaries (and their customers) may pay a fee. Because the reserves backing this insurance are modest and many of the large deposits upon which most of the more prominent banks depend are uninsured, much of the confidence in banks, pension funds, and other intermediaries derives from an implicit guarantee by the federal government to maintain a stable financial system. The importance of this implicit insurance may be so great that banks and pension funds, the only intermediaries favored with explicit insurance, may be the only intermediaries that must pay for their insurance (Wojnilower 1989).[9]

[9] The scope of explicit insurance extends beyond financial intermediaries under these circumstances. The support of "policy" extends through the money market—government securities, repurchase agreements, federal funds, commercial paper (Penn Central)—to the credit market—mortgage participations and passthroughs, small business loans, farm

Whether insurance is explicit or implicit, this guarantee creates a "put" written by the government in favor of financial intermediaries, their "depositors," and their borrowers. A commitment to financial stability for the sake of long-term economic development entails a commitment to a relatively smooth course of GNP, incomes, and therefore asset values, breeding financial contracts, institutions, and conventions that presume such stability. Unless insurance is limited or regulations can restrain financial arrangements, financial instruments, under some circumstances, may become more dependent on such stability through, for example, greater leverage, the willingness to rely on the projected values of more assets as collateral, the design of contracts, and the embedding of shrinking variances in asset pricing.

This put can harm economic development. If the government is to ratify asset prices, its policy, to a degree, must enforce investors' expectations (Keynes 1936; Minsky 1985). Whenever the government, because of social externalities or changes in circumstances, would be inclined to pursue policies that would depress the prices of assets, the commitment or need to maintain a sufficient degree of financial stability may limit the latitude of policymakers (Federal Reserve Bank of Kansas City 1986). When financial contracts are less dependent on this commitment, policymakers may have more discretion.

Capital and Credit Controls

The agency costs associated with financial intermediation may be reduced by capital and credit controls. Capital controls limit the degree to which intermediaries may reduce their reliance on equity financing. Credit controls restrict an intermediary's choice of assets in order to limit the risk they might assume. If these controls are binding, they also tend to limit intermediation and raise the overall cost of capital for investors.[10] Credit controls, to the degree they require or encourage intermediaries to acquire debt rather than equity, tend to foster investors' reliance on debt financing.

Binding credit controls expose intermediaries to competition from other enterprises (including brokers, finance companies, and nonfinancial corporations) that are not subject to the same regulations. As the yield on regulated bank assets, for example, falls relative to the returns offered by the portfolios of competitors, the rate of return on equity of

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lending—and to businesses themselves through outright guarantees (Chrysler and Lockheed) to income support programs (import quotas, tariffs, price supports).

[10] If businesses are not indifferent about their financial structure (see footnote 3), then controls that alter the relative supplies of different types of financing essentially increase the cost of capital.

banks tends to fall relative to that of other enterprises (Gurley and Shaw 1960). Consequently, to offer a competitive return on equity, either banks must reduce their ratio of common stockholders' capital to assets, or banks must enter other lines of business. As economic conditions, computer technology, and the regulations governing underwriters and brokerage firms (such as the abolition of fixed commissions and the advent of shelf registration) during the 1960s and the 1970s bred strong competition for banks and insurance companies, the seigniorage that they received from their charters became insufficient to maintain an adequate return on common stockholders' equity. Accordingly, these intermediaries explored "financial innovations," and their ratios of capital to assets fell as they attempted to sustain a competitive return on equity (table 4).

Besides explicitly insuring their liabilities, public policy might attempt to bolster the rate of return on capital of regulated intermediaries in several ways (Gurley and Shaw 1960). The government may invest in the equities of these intermediaries, perhaps "nationalizing" them: Farm Credit System, Federal Housing Finance Board, Federal Home Loan Mortgage Corporation, Federal National Mortgage Association, Student Loan Marketing Association, College Construction Loan Insurance Association, Commodity Credit Corporation, Farmers Home Administration, Export-Import Bank, Rural Electrification Administration, Foreign Military Sales, Small Business Administration, and Veterans Administration. Through these agencies and enterprises as well as through other means such as the tax codes, the government also may guarantee or subsidize qualifying borrowers or creditors. Furthermore, small and "inefficient" intermediaries could be combined into larger enterprises, which might become more efficient, as is occurring in the banking and thrift industries.

The capital and credit controls that apply to financial institutions are numerous and often complex. Because the functions of intermediaries are not always distinct and the interactions among intermediaries and financial markets are extensive, the regulations that govern each intermediary or financial market also may influence others. With these explicit controls, tax laws and general security or trust laws also influence the financial policies of intermediaries.

Before the 1930s, many banks both held and underwrote a variety of securities, including stocks and bonds, in order to supply the capital financing required by growing industries. To the degree banks bridged savers' fundamental lack of information about investors, critics believed that allowing banks to offer securities to the public created a considerable moral hazard (Carosso 1970). During the 1930s, these long-standing concerns about conflicts of interest and insider information yielded federal legislation separating commercial and investment banking. Responding to the opportunities offered by post-World War II economic

development, many domestic banks have emerged as investment banks abroad. Many also have resumed merchant or investment banking at home through their activities as dealers in credit market instruments or in offering municipal securities, loan syndications, participations, negotiable certificates of deposit, and, recently, commercial paper or corporate bonds. Although banks generally can hold only minimal equity, creative arrangements like small business financing, yield enhancements, warrants, options, participations, and the development of venture capital affiliates allow banks somewhat more latitude (Saulsbury 1987, U.S. Congress 1987–1988). The attraction of investment banking and equity participations has only increased with the recent adoption of more stringent capital requirements for banks which, by the early 1990s, may restore their capitalization to levels resembling those of the 1950s and 1960s (table 4).

Early in this century, most life insurance companies were prohibited by the State of New York from holding common stocks or underwriting securities (Carosso 1970, Jones 1968). During the early 1960s, new regulations permitted the creation of separate accounts in which life insurance companies could hold modest amounts of equity in order to better compete with other institutional investors for the rapidly growing pension and annuity business. Insurers also acquired some real estate, securities with "equity kickers," and other assets that offered some of the characteristics of an equity interest. Recognizing that a portfolio comprising risky assets need not be very risky itself, the most recent revisions of insurance regulations give insurers much more latitude to acquire equity. Due partly to competitive pressures, the ratio of capital to assets for insurers, like that of banks, fell during the past three decades. Moreover, for mutual insurance companies especially, regulations often specified ceilings for surplus accounts in order to prevent these companies from withholding an excessive proportion of their earnings from their owners (policyholders).

Pension plans comprise a variety of financial arrangements, which include annuities, employer-sponsored thrift accounts, deferred compensation plans, and individual retirement plans, funded with assets managed by investment advisors, trust companies, insurance companies, or banks (McGill and Grubbs 1989). Pension fund sponsors have placed a significant proportion of their assets in equities, a proportion that increased greatly during the 1960s and early 1970s (table 4).[11] To the extent this allocation of assets depends on the relative yields of debt and

[11] Since 1974, equity's share of private pension assets has fallen more than 10 percentage points; over the same interval, its share of state and local retirement funds has risen by nearly the same amount.

equity, the comparatively attractive real interest rates now available to untaxed pension funds may diminish equity's appeal (Black and Dewhurst 1981; Tepper 1981; Friedman 1985). The potential appeal of debt may be even greater if federal regulations, accounting standards, and the interests of sponsors tend to foster immunization strategies—running a matched book wherein the duration of accumulated liabilities essentially equals that of assets (Bodie 1989; Black 1989).

Financial intermediaries may not fulfill their potential for efficiently transferring resources from savers to investors when they hold negligible equity in enterprises that are unfamiliar to savers. Not all information about an investment project receives the same attention from a creditor who has no equity interest. Furthermore, "bankers" who are no more than creditors are less likely to enjoy the full confidence of investors whenever the interests of owners conflict with those of creditors. The efficient transfer of resources also is promoted relatively little by intermediaries that acquire the equities of large, familiar corporations (as prudence, contractual responsibilities, and practical management seem to require of many pension funds or trusts). In place of financial intermediaries, the nonfinancial corporations that enjoy a relatively low cost of capital become a source of equity financing for those investors who are less familiar to savers.

Market Discipline

One tactic for reducing the risks inherent in intermediation would shift some of these risks onto the customers or creditors of financial intermediaries. An extreme version of this tactic would tie the returns on indirect securities more closely to those on the assets held by intermediaries. Insured deposits and annuities, for example, might be offered only by intermediaries that acquire securities either written or guaranteed by the federal government.[12] Another version would require intermediaries to finance some proportion of their assets with short-term subordinated debt. Accordingly, the fear of losing customers or paying creditors penalty rates would discipline intermediaries. A more promising approach, however, would mandate relatively high mini-

[12] With such insured institutions, the government essentially becomes the financial intermediary by bearing the responsibility for the making of loans financed either with government securities or its guarantees. If insured banks, for example, also may acquire some assets other than those bearing the explicit guarantee of the government, then a "social contract" (featuring a "put" written by the government to these banks as designated agents) tends to bestow an implicit guarantee on the value of these qualifying assets, unless perhaps they are of small consequence in the portfolios of these banks.

mum capital requirements to be financed entirely by the holders of common stock.

Intermediaries, like other enterprises, exist because they represent the most economical means of bridging differences between savers and investors (Coase 1937). Accordingly, outsiders may not be capable of accurately auditing intermediaries at a reasonable cost (Randall 1989, pp. 10–13; Avery, Belton, and Goldberg 1988; Berger, Kuester, and O'Brien 1989). In the extreme version of this approach, establishing mutual funds, savers might find little common ground with investors. The less extreme version, mandating subordinated debt, may only reshape agency costs rather than reduce them. When an intermediary is under duress, the interests of subordinated creditors may coincide with those of equityholders; witness the behavior of the Federal Savings and Loan Insurance Corporation, the Federal Home Loan Bank System, and the government during the 1970s and 1980s with regard to failing savings and loan associations. When the assessment of outside creditors is more pessimistic than that of the better informed managers of intermediaries, the process of intermediation can become less efficient; the reduction in agency costs may not offset the greater cost of capital imposed by outside creditors.

In any case, market discipline need not reduce the costs imposed by the threat of runs or by winner's curses. To the degree outsiders are more susceptible to fads than insiders, oversight by outsiders could increase these risks. For example, pension fund managers subject to quarterly reviews by their plans' sponsors are criticized for their undue attention to short-run performance, their "herd instincts," and their inclinations toward "window dressing." Similar criticisms are applied to banks that also seek favorable ratings from the securities community. "Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally" (Keynes 1936, p. 158). Though checks and balances are a cornerstone of our society, perhaps the hand of public opinion already rests sufficiently heavily on many of our intermediaries.

Instead of asking outsiders to discipline intermediaries, regulations may encourage insiders to do so. Relatively high minimum capital requirements to be financed entirely by common stockholders (residual claimants) rather than creditors (including preferred stockholders) may diminish agency costs. If the intermediary is to be "sold" to others when its capital requirements are not satisfied, then the owners and managers of the intermediary bear more of the burden of risk-taking. Accordingly, intermediaries tend to make a more balanced assessment of the prospective returns on their assets.

Regulation and Economic Stability

We have described the way in which regulations influence the flow of funds from savers to investors. But, do these regulations make financial intermediation more secure? Do more secure intermediaries promote a more stable economy? Do these goals conflict? Our current regulatory structure reflects how these goals were weighed in the aftermath of the Great Depression. FDIC Chairman Seidman described the rationale for the Glass-Steagall Act which restricts banking activities as follows:[13]

> First and foremost, it [the Glass-Steagall Act] would help protect and maintain the financial stability of the commercial banking system, and would strengthen public confidence in commercial banks . . . Finally, the assumed potential for bank securities operations to exaggerate financial and business fluctuations and undermine the economic stability of the country by channeling bank deposits into "speculative" securities activities would be eliminated.

Both the domestic and international financial market conditions have changed substantially since 1933, raising questions as to whether current regulations, not only Glass-Steagall but also deposit insurance and capital requirements, appropriately weigh the goal of making intermediaries more secure against the goal of fostering a more stable economy.

The Model

To understand the role of regulation in promoting secure intermediation, we start with a simplified model of an intermediary in the absence of regulation. The model can be summarized in three equations that describe the intermediary's return on assets, the return to stockholders, and the utility of stockholders.[14]

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[13] This quote is part of the testimony that L. William Seidman, chairman of the Federal Deposit Insurance Corporation, presented to the House Committee on Energy and Commerce. Chairman Seidman, as well as the Comptroller of the Currency, the chairman of the Federal Reserve, and the chairman of the Securities and Exchange Commission, all argued that banking activities needed to be extended beyond what was permitted in the Glass-Steagall Act (U.S. Congress 1987-1988).

[14] This model does not take into account the opportunity cost (in terms of risk or returns) of stockholders' investment in the intermediary. Consequently, it is not a "general equilibrium" model. Nevertheless, for the experiments considered in this paper (the changing of regulations) the model's qualitative conclusions, in most circumstances, coincide with those of more complete models.

$$R(A) \sim N(u_R(A),\ v_R(A)) \quad \frac{du_R}{dA} < 0,\ \frac{dv_R}{dA} > 0 \tag{1}$$

A—asset size
R—return on assets
v—variance of return
u—mean of return

$$r = \frac{(R - iL)}{(1 - L)} \qquad r \sim N\left(\frac{(u_R - iL)}{(1 - 0\,L)},\ \frac{v_R}{(1 - L)}\right) \tag{2}$$

L—debt/assets
i—interest rate on debt
r—return on equity

$$U(u_r,\ v_r,\ [1 - L]A) \quad U_1 > 0,\quad U_2 < 0,\quad U_3 > 0 \tag{3}$$

The first equation describes the return on assets, which declines as assets increase. This equation models a declining marginal efficiency of capital. For example, a bank wishing to substantially increase its loan portfolio will have difficulty maintaining the same quality of loans, resulting in loans with a lower expected return or a higher variance. The current problem loans to developing countries partly reflect the difficulty banks had maintaining their loan opportunities during their rapid growth in the 1970s.

The second equation describes the return to shareholders due to leveraging. Because of leverage, the mean return to shareholders, u_r, and the variance of the return to shareholders, v_r, are greater than the mean and variance of the return on assets. The relationship between the interest rate on debt (i) and leverage is shown in figure 1 and described more fully in the appendix. Even at very low levels of leverage, the interest rate on debt is above the risk-free rate, i_f, since the probability that losses will be so great that the debt cannot be paid off is low, but positive. As leverage increases, so do the probability of default and the interest rate. For any given leverage, increases in A or v_R, or decreases in u_R increase the rate of interest because the probability of default increases.

Shareholders choose A and L to maximize their utility, as described in equation (3). Shareholders are risk averse; they prefer higher returns but lower risks. The utility of shareholders increases with their wealth [(1 − L)A].

Equilibrium levels of risk and return are shown in figure 2 where the shareholders' marginal utility equals the marginal return. For a given asset size, the return line is concave. Initially the increased return

Figure 1

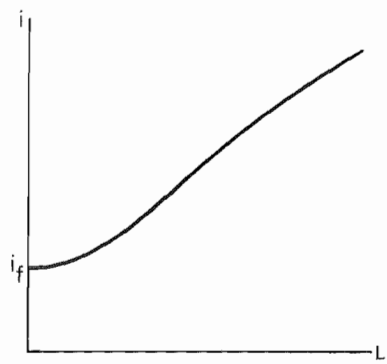
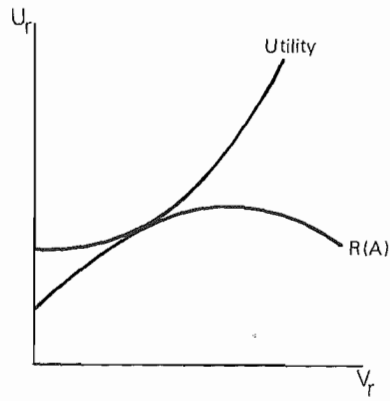


Figure 2



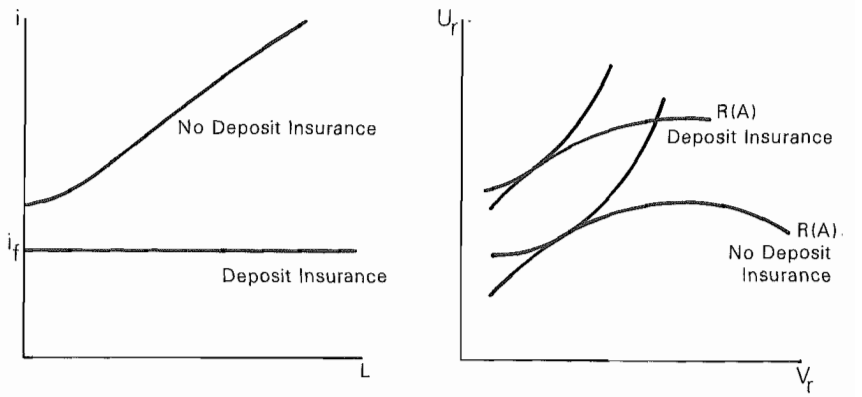
from greater leverage exceeds the increase in the interest rate. Eventually debt holders require such a large premium that any further increase in leverage decreases the expected return. If shareholders only maximized return, leverage would increase until the advantages of debt-financed investment ($u_R - i$) just equaled the cost of the additional debt ($i'L[1 - L]$). With risk-averse shareholders, leverage will be lower than for risk-neutral stockholders because v_r increases with leverage.

The objective of regulators is to ensure a secure intermediary, either by providing guarantees to customers (for example, deposit insurance) or by minimizing the probability of default by reducing v_r (for example, by capital requirements and asset restrictions). Since regulators and shareholders have different goals, conflicts will occur when shareholders wish to assume more risk than regulators are willing to accept.

Deposit Insurance

The conflict between shareholder utility maximization and the goal of achieving secure intermediaries is most apparent with deposit insurance. By eliminating the risks of financial loss for customers, the cost of borrowed funds does not depend on the risk borne by the institutions. Figure 3 shows that the interest rate is now a horizontal line at the

Figure 3



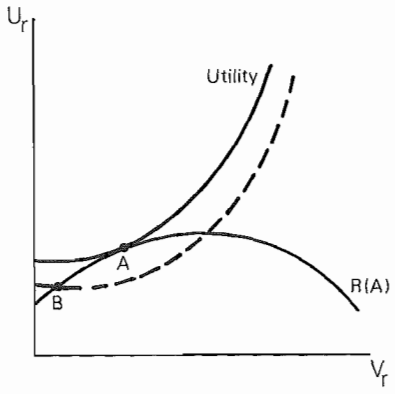
risk-free rate, since in the event of a default, the insurer rather than the intermediary's assets pays the customer. With the interest rate penalty for taking additional risk eliminated, shareholders can increase their return by increasing leverage.

The right panel of figure 3 shows that deposit insurance results in a higher return for any given stock of assets, because no risk premium is required on the borrowed funds. Shareholders are better off, since they are on a higher indifference curve. If shareholders only maximized return, the firm would take full advantage of debt financing and increase its assets until $u_R = i$. Insurance does not foster higher leverage if the insurance premiums are fully risk-adjusted. With appropriately priced insurance, the insurer behaves as a creditor in an unregulated market. Thus, while depositors would require no premium, the risk premium on the insurance would cause the intermediary to assume the same leverage as it would without deposit insurance.

Capital Requirements

Deposit insurance encourages intermediaries to take greater risks, which regulators try to offset with capital regulations and asset restrictions. By raising capital requirements, regulators may increase the

Figure 4

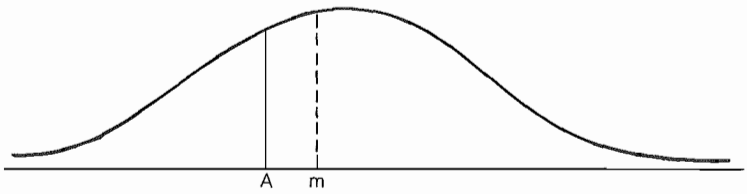


amount of equity at risk before creditors (or the insurer) lose money, and reduce the variance of shareholder returns. Once leverage is set by the regulator, the only choice remaining for shareholders is to pick the optimal size of the intermediary. Figure 4 shows that imposition of capital requirements causes the firm to move down its return line from A to B. The lower expected return to shareholders as a result of higher leverage can be partially offset by reducing assets.

Greater capital requirements reduce the variance of shareholders' returns along with their average returns. Consequently, shareholders would prefer to acquire riskier assets if they promised shareholders a higher return.[15] If we adjusted the model to allow shareholders to choose the risk and return of assets, u_R becomes a function of v_R. In response to higher capital requirements, which lower u_r and v_r, shareholders could choose riskier assets with higher expected returns. Depending on how sensitive u_R is to v_R, the variance of equity may be greater with capital requirements than without.

[15] It is possible that rational shareholders will invest in a project with higher v_R and lower u_R, if the value of equity is very low or negative. This will occur because with negative net worth all the potential loss is paid by the debtholder or insurer, while shareholders receive much of the potential gain.

Figure 5



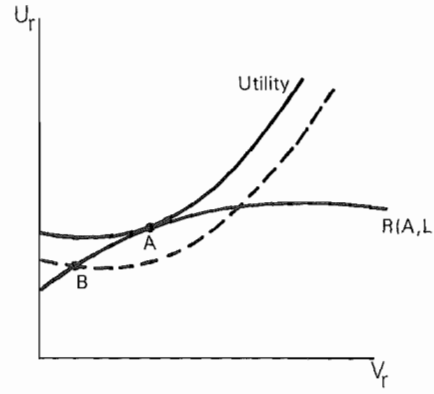
Asset Restrictions

Asset restrictions require intermediaries to invest in assets viewed as "safe" by regulators. Banks, for example, generally cannot hold equity.[16] Figure 5 shows the possible returns accruing to an investment. The upper tail represents the returns to equity holders. If the project pays less than A, creditors get partial payment and shareholders receive nothing. The expected return of the project, m, includes the whole distribution. While the probability that the stake is valueless is much lower for debt holders than for shareholders, by not participating in the upper tail, creditors must receive a return less than m. The requirement that banks hold only debt reduces their expected rate of return. The lower u_R increases the probability of default, causing shareholders to reduce leverage and asset size.

Asset restrictions ideally would reduce v_R; however, this result is virtually impossible to achieve. Undertaking credit or interest rate risk does not require exotic financial instruments. Interest rate risk can be achieved with government bonds, and the worst credit risks may be local business loans. Even these sources of risk cannot be effectively monitored by examiners, since interest risks can change in a few

[16] In countries such as Germany, banks are allowed to hold equity. McCauley and Zimmer (1989) find that close relations between banks and corporations can reduce the costs and the probability of bankruptcy.

Figure 6



minutes and some credit risks are difficult to determine even after extensive interviews and documentation.

If asset restrictions could sucessfully reduce v_R, they still might not reduce v_r. Figure 6 illustrates the effect of asset restrictions when u_R is a function of v_R. Unlike the previous figures, the slope of the return line is determined by increasing v_R rather than leverage. The return line increases at an increasing rate as shareholders must make increasingly risky investments to increase the average return. Any change in assets or leverage shifts the return line. If regulators required less risky assets, movement from A to B, both the mean and the variance of shareholder returns would drop. In response, shareholders could increase assets or leverage.

Regulatory Choices

Table 7 summarizes the effects of different regulatory choices. Deposit insurance unaccompanied by other regulation eliminates risk for depositors but makes the intermediary less secure, since shareholders have an incentive to expand and to increase leverage. The costs of regulation by insurance fall upon the government. The government subsidizes the insurance by $i - i_F$ – the deposit insurance premium. Increases in risk, caused by greater leverage and expansion of assets, increase the size of the subsidy. If capital regulation is not enforced, the

Table 7
Effects of Regulatory Choices

Regulation	Effect on			
	Leverage	Asset Size	Shareholder Utility	Cost to Government
Insurance	+	+	+	+
Capital Requirements	−	−	−	0
Equity Restrictions	−	−	−	+
Asset Restrictions	+	+	−	0

probability of default can rise rapidly, as it did for the savings and loan industry during the early 1980s, and if other intermediaries are covered by implicit insurance, the government subsidy to these intermediaries is greater than that to the banking industry.

Unlike deposit insurance, capital requirements decrease leverage, the growth of assets, and the utility of the shareholder. Capital requirements are used frequently to regulate intermediaries because they reduce leverage without any cost to the government, other than administrative expenses. While intermediaries can substitute asset risk for leverage risk, substantial equity stakes avoid the incentive for risk-taking that occurs when only debtholders or insurers bear the cost of unsuccessful investments.

Equity restrictions require no expenditure of government funds but do little to reduce the assumption of risk by intermediaries. Such restrictions do not increase the stability of the intermediary since equity positions in well-capitalized stable enterprises may be less risky than loans to highly leveraged risky enterprises. Furthermore, restrictions may increase the risk of corporate failure, both because intermediaries may too quickly abandon potentially profitable projects and because intermediaries encourage debt as a source of funds for firms whose financing needs might be better accommodated with equity.

By not changing regulations with changing economic conditions, the regulator is, in effect, choosing a different regulatory mix. Higher and more variable interest rates in an unchanged regulatory environment diminish the influence of asset restrictions and capital requirements while increasing the deposit insurance subsidy. Asset restrictions are less confining because the variance of returns on assets often exceeds that which was anticipated when asset restrictions were adopted. Capital requirements based on book values of assets and liabilities become less binding because the market value of equity falls even if its book value is unchanged. In contrast, insurance is more valuable to

shareholders because the greater risk from higher leverage and more variable asset returns is not reflected in the cost of funds.

In summary, while deposit insurance makes depositors more secure, it may at the same time make intermediaries less secure and the economy less stable. Insurance encourages intermediaries to take greater risks, both by assuming greater leverage and by making riskier loans (greater V_R). To the degree savers are attracted to insured depository institutions that are prevented from holding equity, current regulations can make the economy less stable.

Conclusions

Financial intermediaries provide services to savers and investors by bearing risks. By transforming the primary securities issued by investors into assets that are attractive to savers, intermediaries reduce the difference between the price savers ask for funds and the price investors bid for funds. As long as intermediaries recognize the consequences of the risks inherent in this mismatched book, their activities facilitate the efficient flow of resources from savers to investors. But intermediaries may impose unacceptable risks on the economy because of externalities, agency costs, and competitive pressures.

Although government regulations attempt to manage the risks inherent in financial intermediation, these regulations, by reshaping our financial system, may increase the risks inherent in saving and investing. Deposit insurance combined with capital and credit controls, as currently designed, fosters intermediation and the use of debt instead of equity financing of investment. Savers have found insured indirect securities more attractive than bonds and stocks. In turn, the assets of financial intermediaries comprise loans, bonds, and, to a degree, the stock of corporations already familiar to savers. Accordingly, the cost of equity financing can be relatively great and volatile for less familiar enterprises that must appeal directly to savers.

Deposit insurance without appropriate safeguards can be expensive for the government. Although agency costs are present for any enterprise that finances its assets with debt, deposit insurance increases the incentives for both intermediaries and firms to assume greater risk and leverage. Risk-based insurance premiums would eliminate many of these incentives; however, the difficulties in setting these premiums are formidable. Instead, regulators impose asset restrictions and capital requirements on financial intermediaries in order to control their assumption of risk.

The reliance on debt financing promoted by existing asset restrictions divides the interests of investors from those of intermediaries,

thereby impeding an efficient flow of information to those financing investments and encouraging intermediaries, as creditors, to "foreclose" prematurely on "disappointing" projects. Asset restrictions also discourage intermediaries from investing in risky but potentially profitable projects that are not suited to debt financing. In this way, regulation may increase economic instability. If banks could assume an equity interest, a less partial assessment of the future value of investments could make the supply of funds to investors more ample and more dependable.

Aside from imparting a creditor's bias to intermediation, tending to make the economy less stable, capital and credit controls do not necessarily make intermediaries more secure. If intermediaries exist because of their ability to process information and evaluate prospective returns, outside regulators may increase rather than reduce risk to the degree they influence intermediaries' asset allocations. Binding capital and credit controls, which diminish an intermediary's return on equity, encourage regulated institutions to assume risks that regulators neither observe nor control. Furthermore, controls that limit the diversification of an intermediary's portfolio may make it less secure. In this respect, regulations governing life insurance companies, which weigh the risk of entire portfolios, are preferable to banking regulations which weigh the risk of specific assets. Regulators also may enhance risk unintentionally by comparing individual intermediaries to industry averages and encouraging greater conformity among institutions. From a social point of view, diversity among as well as within intermediaries may promise the greatest security.

Although intermediaries play an important role in economic development, regulations that might make these institutions more secure do not necessarily make the economy more stable. For example, deposit insurance coupled with capital and credit controls increases savers' reliance on the implicit guarantee of investors' cash flows. A presumption of financial stability by savers commits the government to ratify asset prices and enforce investors' expectations. During the past thirty years, this "put" written by the government has been expanding. It is not coincidental that the largest and fastest-growing intermediaries (including the government and its sponsored enterprises) have been those with explicit "deposit" insurance. Whenever prudent macroeconomic policies cannot sustain the value of international, oil patch, real estate, or farm loans, the subsequent financial collapse may be more severe to the degree that savers, intermediaries, and investors have come to rely on this presumed commitment.

The risks inherent in financial intermediation might be controlled most efficiently by substantially relaxing asset restrictions and by adopting more stringent capital requirements. To the degree intermediaries

maintain a competitive return on equity despite asset restrictions, by reducing their ratios of capital to assets, the relaxation of asset restrictions can be exchanged for greater minimum capital ratios. If regulators are able to transfer the ownership of intermediaries that fail to meet their capital requirements when existing owners and managers still have a substantial stake, the incentives for risk-taking by the institution will be diminished. These capital requirements can be effective only if the capital of intermediaries can be measured accurately. Failure to reprice assets for changes in credit ratings and changes in interest rates misrepresents shareholders' stake in the intermediary. When the market value of equity is unacceptably low and the book value of equity is sufficiently great, rational shareholders should take greater risks, since losses will be borne by creditors or insurers while shareholders receive the gains.

Appendix

Figure 1 and Figure 3—The interest rate, i, compensates creditors for the risk of bankruptcy. i will always exceed i_f, since there is always a possibility that debt will not be paid off. This line is described in equation (A.1):

$$i - i_f = \int_{-00}^{L(1+i)-1} (i - R)\ \text{pdf}\ (R)\ dR \qquad \text{(A.1)}$$

$$\frac{di}{dL} > 0, \quad \frac{di}{dv_R} > 0, \quad \frac{di}{du_R} < 0.$$

Shareholders choose assets and leverage to maximize utility. When assets increase, the return line shifts up since u_R falls and v_R rises. The greater the leverage, L, the higher the probability of bankruptcy, and the more creditors must be compensated for the additional risk.

Deposit insurance eliminates creditor risk, so $i = i_f$.

Remaining figures—Shareholders choose leverage and assets to maximize utility.

$$\underset{L,A}{\text{maximize}} \left(\frac{u_R - iL}{(1 - L)}, \frac{v_R}{(1 - L)^2}, (1 - L)A \right) \qquad \text{(A.2)}$$

$$0 = U_1 \left[\frac{u_R - i - i'L(1 - L)}{(1 - L)^2} \right] + U_2 \left[\frac{2v_R}{(1 - L)^3} \right] - U_3[A] \qquad \text{(A.3)}$$

$$0 = U_1\left[\frac{u_{R'}}{(1-L)}\right] + U_2\left[\frac{v_{R'}}{(1-L)^2}\right] + U_3[1-L] \qquad (A.4)$$

Deposit Insurance—As described above, deposit insurance severs the link between the interest rate and leverage, so i'L = 0 and the interest rate drops to the risk-free rate. Equilibrium is restored with higher leverage and greater asset size.

Capital Requirements—L is no longer a choice variable. With binding capital requirements L drops, causing equation (A.4) to be positive. Equilibrium is restored with fewer assets.

Equity Restrictions—Firms hold only debt, causing u_R to fall. Equation (A.3) becomes negative. Equilibrium is restored with lower leverage and fewer assets.

Asset Restrictions—Firms maximize equation (A.2) with respect to v_R and the mean is a function of the variance:

$$0 = U_1\left[\frac{u_{R'}}{(1-L)}\right] + U_2\left[\frac{1}{(1-L)^2}\right] \qquad (5)$$

If regulators require v_R to drop, firms increase leverage and asset size.

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Discussion

*Ben S. Bernanke**

The title of the Kopcke-Rosengren paper fits in with the theme of the conference but is slightly misleading. Little direct regulation of debt and equity per se actually occurs; that is, few restrictions exist on the kinds of financial contracts that could in principle be written. For the most part, the effect of public policy on financial contracting is indirect, operating through the tax code, the laws pertaining to corporate governance and bankruptcy, and the regulation of financial intermediaries. It is this last channel of policy—the regulation of financial intermediaries—on which the paper actually focuses, and on which this comment will focus as well.

The paper falls naturally into two parts. The first section argues that increasing reliance of household savers on intermediated assets, plus regulations that induce intermediaries to hold mostly debt, have led to a growing pro-debt bias in the economy. This is an interesting suggestion; it affords a different perspective by looking at the behavior of suppliers of funds in order to explain trends in leverage, rather than at the behavior of demanders of funds (firms), as is more common.

Some evidence can be found that this change in the composition of household wealth may have influenced very long-run trends in leverage. It is less clear, however, that savers' preferences have played an important role in the leverage trends of the past twenty years. Table 2 in the Kopcke-Rosengren paper shows that, as a share of financial assets, deposits have been stable since 1970–74; all of the growth among

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indirect securities since that time has been concentrated in pension fund reserves. Unlike banks, of course, pension funds do not face direct restrictions on holding equity and indeed hold a larger share of assets as equity than do households.[1] This observation, plus the fact that greater amounts of government debt are competing with corporate debt for a place in wealth-holders' portfolios, makes it hard to argue that the relative supplies to corporations of debt and equity finance have recently shifted toward debt. Further, as Kopcke and Rosengren themselves point out, historically the composition of firms' external finance has not been sensitive to changes in the sources of funds. Thus it still seems likely that leverage trends in the 1980s have more to do with the decisions of firms than with the decisions of savers.

On the other hand, the failure of households to hold a larger share of wealth as equities, despite the stock market boom of the past seven years, is surprising. The decline in the relative share of noncorporate equities could be explained as a data problem, reflecting the difficulty of measuring the market values of non-traded stock, but of course this does not apply to corporate equities.

The second main part of the paper, comprised of the second and third sections, discusses the economics of financial intermediary regulation. Any serious discussion of this issue immediately raises two basic questions: (1) Why are intermediaries regulated in the first place? (2) If we accept that regulation of intermediaries is desirable, what are the optimal regulatory instruments? The paper emphasizes the strengths and weaknesses of specific regulatory instruments but does not, I think, give enough attention to the first, logically prior question.

The intellectual basis for intermediary regulation is in fact somewhat shaky. Kopcke and Rosengren write, "Because of agency costs, externalities, and competitive pressures, financial transactions may impose unacceptable risks on the economy without offering adequate compensation." This statement is not wrong, as I will discuss, but it glosses over some difficult issues. As a theoretical matter, the existence of agency costs, which are endemic to many parts of the economy besides financial markets, does not in general justify government intervention; and in practice, attempts to regulate industries with high agency costs can be counterproductive, as anyone who buys auto insurance knows. "Competitive pressures" is a strange argument for regulation; usually we think that markets work better when there is competition. Probably what the authors are thinking of here is the interaction of competitive pressures with existing perverse regulations,

[1] This is true despite the incentive, noted by Bodie at this conference, for defined benefit plans to hold debt to hedge their obligations.

such as asset restrictions. What is meant by "externalities" is not specified, but I think there is something to this, as I will discuss in a moment.

Historically, of course, much of our current financial regulatory structure arose as a response to the collapse of banking and financial markets in the Great Depression. The measures taken in the New Deal did help to end the crisis and to prevent major financial problems over the ensuing half-century. Thus the 1930s-era regulations, particularly deposit insurance, have long been hailed as a major policy success. Nevertheless, the historical record does not unambiguously support regulatory intervention in financial markets, and a revisionist view has lately become popular among some financial historians. These historians have argued that, prior to the Great Depression, largely unregulated financial systems in both the United States and other countries performed well and contributed substantially to economic growth and development. True, the United States had periodic financial panics; but (the argument goes) the damage caused by these was controlled by suspension of convertibility, clearinghouse oversight, and other private mechanisms. The specific problems of the Great Depression were *caused*, in this view, by inept regulatory intervention: unit banking laws, which kept banks small and vulnerable; the suppression of the clearinghouses; and the mistakes of the Federal Reserve.

Given the lack of a well-articulated theoretical rationale for intermediary regulation and the ambiguous verdict of history, is there any basis for government intervention in financial markets? If there is one, I think it must be based on something like the following logic:

(1) The performance of financial intermediaries, like that of many firms, is strongly affected by their financial condition. Intermediaries in financial distress, that is, with low or negative net worth, have incentives to take socially undesirable actions, such as making excessively risky investments. (This seemed clearly to be the case with the S&Ls.)

(2) Because the various components of the financial system are so closely interconnected, and because finance plays a particularly central role in the organization and functioning of a capitalist economy, a widespread malfunctioning of the financial system would pose unacceptable costs not only to the institutions and those directly contracting with them, but to the economy at large. Possible sources of externalities arising from financial failure include the closing of important financial markets (which might occur if important dealers or the clearinghouse failed); loss of liquidity and market-making capacity in markets that remain open; the destruction of unique information capital, implying cutoffs of credit to third parties; and aggregate demand externalities.

(3) Because of these costs to the economy at large, ex post the government would have no alternative but to "bail out"—that is, transfer wealth to—the financial system if large institutions got into trouble. This is the "put" on the government that Kopcke and Rosengren refer to; it can also be thought of as a "time consistency" problem, arising because the government cannot effectively commit in advance not to bail out those in trouble. By the way, as Brimmer (1989) discusses, this "put" on the government now appears to be held not only by large banks but also by other financial markets and institutions, such as the commercial paper market, the exchanges, and the clearing and settlement systems.

(4) Because of the external effects and the involuntary insurance provided by the government to financial institutions, financial arrangements drawn up ex ante and the risks taken by financial decision-makers do not fully take into account downside risks. This provides a rationale for some ex ante controls and monitoring by the government.

If we accept the view that some scope exists for regulation, then we arrive at the second question, what tools should be used to regulate financial institutions. Here I agree with Kopcke and Rosengren's diagnosis: Put as succinctly as possible, "Capital requirements good, asset restrictions bad." This follows directly from a basic principle of agency theory, that in situations of pervasive asymmetric information, the principal is better off setting the agent's incentives in a way that makes him internalize the effects of his own actions, rather than trying to control the agent's actions directly. Asset restrictions are an attempt to control actions, which is usually futile or even counterproductive when the financial institution has more information about its opportunities than the regulator. As the paper notes, even when asset restrictions succeed in modifying individual institutions' behavior, they can have perverse general equilibrium effects, for example, by increasing economywide leverage or by reducing industry diversity. Capital requirements are an imperfect tool, but a well-capitalized institution is more likely to internalize the full costs and benefits of its decisions and thus make good choices (from the social point of view).

The third major element of public policy with respect to intermediaries is deposit insurance. The authors correctly point out the intrinsic problems with government insurance of risky and illiquid investments. Deposit insurance would work better with strong capital requirements, but I think the best solution is to phase out deposit insurance of risk-taking institutions. An alternative model which deserves serious consideration is Robert Litan's (1987) "narrow banking" idea. Litan's suggestion is that banks that wish to take insured deposits would have to back them only with extremely

safe assets, such as government securities. Uninsured banks would face no asset restrictions, but presumably would finance themselves mostly by equity or long-term debt rather than deposits. This would alleviate the need for government oversight of information-intensive investment, at the same time that it protects the money supply. For reasons discussed above, though, it might still be necessary to impose capital requirements on uninsured banks.

I will close with a few comments on the formal model of an intermediary included in the last section of the paper. I was not completely happy with this formalization. Here are my complaints:

(1) As specified, the only choice variable of the managers or shareholders is A, the quantity of assets. Since the choice of total assets is presumably observable by lenders, strictly speaking no agency problem exists in the model. A fully efficient financial contract can be written, that is, one that leads to the socially optimal level of assets. The contract could be thought of as a loan with an interest rate that depends on the level of assets and an expected return equal to the opportunity cost of funds in the economy.

(2) The expression for the return to shareholders is not truncated at −100 percent return. Implicitly, equation (2) assumes that shareholders are always required (and able) to pay off the loan. If this were so, the loan would pay the risk-free rate.

(3) The expression for shareholder utility does not make sense to me. A (1 − L)—do the authors mean A − L?—is not the shareholders' wealth but the portion of their wealth that they contribute to bank capital. Utility should depend on the mean and variance of the shareholders' entire portfolios, not just on the part invested in the bank.

(4) How is the "bank" modelled in this section different from any corporation borrowing funds? and (even if there are deadweight losses due to agency costs) where are the external effects of the financial contract that would motivate regulation? This is an unfair question, since I am not sure, either, how to model the "special" features of intermediaries or the possible externalities associated with intermediary failure. But that is the direction in which research should go.

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Discussion

*Albert M. Wojnilower**

Richard Kopcke and Eric Rosengren have submitted a most thoughtful appraisal of the role of financial intermediaries and regulators in the corporate debt surge. Like all economists, the authors are well aware how difficult it can be to regulate effectively and how unpredictable and undesirable may be the side effects. While sympathizing with their misgivings, let me confess up front that I do not share our profession's indiscriminate objections to regulation. As the savings and loan crisis illustrates, delay in making awkward choices among regulatory alternatives can lead to even more unpleasant predicaments in which no choice is left at all as to the nature and scope of intervention.

The Shrinking of Corporate Equity: What's Good for Each Is Not Good for All

The hybridization of debt and equity that has been the theme of this conference performs a most useful economic function. The financial changes taking place in many companies are the proper response to the prevailing global winds. The problem is that, from the standpoint of the economy as a whole, the process is bound to be overdone. The incentives are so overpowering that issuers and investors alike are driven to make ever more optimistic assumptions as to the government's ability to cope with shocks and to avert interest rate increases

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and/or recessions. Competition is forcing corporate officials increasingly to take for granted that a free insurance policy written by the political process must indemnify them for industrywide or economywide problems. A serious systemic risk is being embedded, from which the economy urgently needs protection. With what I believe to be the authors' permission, I will comment only briefly on their paper and use the rest of my time to argue a rather nonintrusive form of capital requirements for nonfinancial corporations that avoids throwing out the baby with the bathwater.

Before tackling that subject, let me enter a few reservations as to the authors' treatment of the financial intermediary sector. They might have sharpened their discussion by drawing a clearer line between depository and other intermediaries. Mutual funds, pension funds, and insurance companies can and do acquire equity positions in various forms. To the extent the public seeks the risks and rewards of equity ownership, it has ample opportunity to do so directly or through these intermediaries. No need exists for additional conduits. Whether banks are to have separately capitalized mutual fund subsidiaries, which is what the authors seem to suggest, is a peripheral issue. So, too, is whether the equity investments in question happen to be new or are acquired in the secondary market. The phenomenon that has spawned this conference is not lack of capital for new ventures, but rather the extinguishment of old equity and its replacement by new instruments that have debt characteristics. Equity securities are being retired at upwards of $75 billion per year, largely using the proceeds of new debt.

The reason that banks and thrifts, in contrast to the other intermediaries, are severely restricted with respect to equity investment is that they are entangled with the national monetary and payments machinery and their deposits are federally insured. Do we really want banks to own more equity securities? Would that have been helpful in avoiding or coping with October 19, 1987? And would we have wanted banks and other intermediaries marked to market and held to account that night? That is what we did in the 1930s with respect to loan valuations, thereby gravely deepening the Great Depression. From this, we learned not to close down the whole banking system during the 1950s, even though most banks sank under water because of the depreciation of the low-coupon Treasury obligations bought to finance World War II. No, there are some investments that "nice" banks, those with insured deposits, simply cannot be permitted to make. For that abstinence, however, they deserve to be esteemed, protected, and —modestly— rewarded.

Kopcke and Rosengren's discussion has the flavor that we might be better off sharply limiting or even withdrawing deposit insurance and the other aspects of the financial safety net. In the remote eventuality

this actually became feasible, what would be the practical consequence? Most of us would then invest much more heavily in government securities, the only "insured" instrument left. This would so reduce the government's cost of funds compared with the private sector that the socialization of investment would become politically irresistible. No solace here for libertarians.

Why Is Equity Being Retired?

The rise in corporate debt ratios during the 1980s reflects the confluence of many factors. First and foremost, in my judgment, is the great intensification of international industrial integration, competition, and specialization, which necessitates the profound redeployment of our capital stock. We have entered a world in which every developed country has to become more specialized in its production—and in which the market for this output is worldwide. To compete, a tradable product must be able to attract a significant share of the world market. A country can achieve this only for a limited number of products. Small countries have always known this. For the United States, however, which because of two oceans and two World Wars has been used to producing almost everything primarily at home, the narrowing of industrial focus is novel and painful. It is compelling the restructuring, or worse, of many major industries and enterprises.

Chronic losses, erosion of equity, and eventual bankruptcy would have been the traditional means of adjustment. Debt-financed takeovers and buyouts are smoother and faster. They are an effective way to "bribe" normally recalcitrant top managements and shareholders to accept prompt retrenchment, as well as to enable them to override the opposition of middle management, unions, and other workers.

Furthering the process is the tide of funds seeking investment opportunities in the United States. This partly reflects the generous monetary policies of the major powers. Just as important, however, is the fact that the world's government as well as private investors prefer, for a multitude of good reasons ranging from distrust of their governments to fear of earthquakes, to invest here. In principle the situation parallels the 1970s, when the OPEC countries flooded the world with investible funds. Then the less developed countries soaked up the overflow. Today's oversupply of funds is spurring the refinancing of the United States.

Why is the process so debt-oriented? Part of the answer is provided by the tax subsidy for debt. The typical company can save taxes by converting dividend payments into interest. Although this incentive is of long standing, the more competitive business environment and

cheaper financial technology are causing it to be exploited more intensively.

While a good deal of the new financing looks like debt, it still smells and tastes like equity. The prices of the securities vary with the fortunes of the issuing companies rather than with the general level of interest rates. The high rates that are stipulated resemble the prevailing rate of return on capital rather than the yield on high-grade debt. Sophisticated investors cannot help but be aware that such returns must be at least as uncertain and interruptible as those on stocks. (Unfortunately $40 billion or so in "junk" bonds may have been sold, mainly through mutual funds, to individuals, most of whom probably believe that consumer protection entitles them to a free lunch.) At bottom, junk bonds and loans are just equity camouflaged to deceive the Internal Revenue Service.

Why Any Equity?

Not so long ago, when the Great Depression of the 1930s was still a living memory, and when capital gains were taxed much more lightly than dividend income, some businessmen would go so far as to assert that no company could ever have "too much" equity or too little debt. The sturdier the equity and the smaller the debt, the better able the company was to withstand specific adversity or general hard times. The equity base provided reliable protection for that network of explicit and implicit contracts among shareholders, creditors, management, employees, customers, suppliers, and the community at large that defines each corporate identity. Deep equity was needed to enable a company to take substantial and long-range risks in investment and innovation.

Today, however, it is taken for granted that government can and will prevent serious recessions. Capital gains no longer enjoy strongly preferential tax treatment. Thus the justifications for hefty equity cushions have lapsed. The apparent capital need is palpably smaller. The potential is also greater for the squandering of capital that has been rendered "surplus" by the change in attitudes.

Capital is perceived as needed only for riding out specific and temporary adversity. As already indicated, however, much of the adversity lately experienced by American business and likely for the future stems from unforeseen sources of international competition that are long-lived and intractable. Traditional companies are especially at risk, particularly if their managements are strongly committed to traditional ways. The market's bias should be and is against taking long-term risks and in favor of forcing companies to shake up management and divest

unprofitable lines promptly. This is what high equity ratios delay—and precisely what high debt ratios and interest burdens speed up.

Putting it more harshly, in a world thought to be depression-proof, a fat equity cushion may foster incompetent or self-serving management. The benefits that such managerial "agents" draw at the expense of shareholders constitute another melon, in addition to the tax melon, to be carved up in debt-financed takeovers. The prices paid in such takeovers suggest that the market, probably correctly, has perceived both melons to be juicy.

Even a tightly run, profitable company must, in this environment, increase its leverage. Unless it does so, it will be "cooked in its own fat" by acquirers who can use the "victim's" own unused borrowing capacity to fund a takeover bid. The market is forcing companies to live closer to the competitive edge.

Although in accord with the current state of the world, this change is not an unmitigated social boon. It compels firms to take shorter-range and narrower views of their function. An ample equity cushion confers advantages similar to those enjoyed by a monopoly. It is what has enabled companies to sponsor pure research with no visible commercial payoff, to furnish executive talent to philanthropies, or to become prominent donors to civic enterprises and universities. As the equity cushion is jettisoned, these voluntary activities—President Bush's "thousand points of light"—fade away.

The configuration of interests and incentives that promotes the "de-equitization" is so powerful that I see no timely self-limiting aspect. Existing public and management shareholders get bought out at bonanza prices. Old management may also benefit from "golden parachutes" and the like. New management (sometimes the same individuals) obtains control of a now heavily indebted company, but usually at little financial risk to itself and with significant new equity entitlements. The new management stands to lose caste in the executive compensation market should its efforts fail, but the potential loss is much smaller than the equity rewards of success.

As for the creditors, they achieve a high-return outlet for their glut of funds in a form preferable to pure equity. Absent default, realization of the return does not depend on the debtor company's willingness or ability to declare dividends, nor on the stock market's reliability in embodying revenue growth or prospects in a higher stock price. The heavy debt intentionally pressures the company to divest sizable chunks of assets, because survival really does depend on paying off the most burdensome debt long before its stated due date. In this key respect, such loans are far superior to the notorious loans that were made in Latin America and Africa, which created incentive and opportunity for borrowing more rather than for repayment. Of course the new kinds of

loans also may sink into default, but unless this happens very early on, before any of the sizable servicing has had a chance to proceed, the lender may not suffer severely. And should, perchance, the indebted company prosper beyond expectations, many loan agreements are structured to include equity "kickers" that enable lenders to share the good fortune.

Needless to add, investment bankers, accountants, and attorneys also have strong incentives to promote the process. And, to repeat, the tax system subsidizes it. Short of some spectacular and unlikely disaster, the de-emphasis of traditional equity is likely to become virtually universal.

Why Worry?

If the social benefit is the elimination of corporate fraud, waste, and inefficiency, while the cost is only the pruning of some research laboratories, orchestras, or universities, why should we be concerned? The reason is, as our experience with depository institutions teaches, that pure equity plays a crucial macroeconomic role in preserving our economic system. It enables businesses to endure an interval of general adversity, whether stemming from shocks or restrictive policies. An adequate equity position at the individual firm level is needed to buy for the economy at large what it was originally intended to provide for individual companies: the survival time to make unavoidable adjustments.

The credit crunches that preceded the deregulation of the depository intermediaries accomplished their disinflationary intent with only minor structural damage, because the intermediaries and their clients were threatened only with insolvency, not bankruptcy. Liquidity and profitability briefly vanished, but because capital was strong the injury was not mortal. Cash was low but capital was strong.

Although equity may no longer be useful from the standpoint of the individual enterprise protected by a national safety net, it remains essential collectively. As my distant cousin, Jack Hirshleifer, pointed out in a very early work, it does not really make much sense for us individually to build nuclear shelters, possibly not even if everyone else did. But it would surely increase the society's survival probability in the event of nuclear attack if everyone had to do so.

The disappearance of equity is taking us into a potentially much deeper "moral hazard" morass than did the Latin American loans or the savings and loan excesses. Now that heavily indebted companies are becoming typical, the risk is already serious that a shock, such as higher interest rates or a recession, could threaten enough household-name

companies to form a critical political mass. As with the depository institutions, it is conceivable that bad news about some firms may infect others that are innocent. It is in any case always in the interest of weak companies, in connivance with sensationalist media, to try to make their troubles general—because that improves the odds the public safety net will be unfurled in their behalf. We should expect to see on TV students barred from college classrooms or widows evicted from their homes because of junk bond disappointments. The now familiar game of chicken between the financial institutions and the government is spreading toward the nonfinancial sector.

Let me be quick to underline that, just as for forty years or more there never has been any serious likelihood that depositors in major banks or thrifts would lose money, the danger of an actual cascade of corporate defaults also is slight or nonexistent. Just as we have seen the governmental rescue function extended to, among others, Lockheed, Chrysler, New York City, the commercial paper market, government security dealers, and most recently the stock market, so may we safely assume that public support would be invoked for any important group of corporate debtors in difficulty. The risk we run by tolerating the attrition of equity is not primarily that of economic catastrophe but rather one of massive governmental rescue operations that deeply politicize the economy.

What Is To Be Done?

We need to formally establish the prevention of systemic failure as an economic policy objective separate and distinct from other macroeconomic goals. That means recognizing that a separate and additional instrument of control is required. The combating of systemic threats cannot be accomplished through monetary or fiscal policy without compromising the other tasks we have set for those instruments.

Given current realities, the new tool has to be one that constrains the borrowers rather than the lenders. Our financial intermediaries, generally speaking, are already weakened by unhappy loans from the past, by actual and potential competition from foreign institutions, and by the rapid advance of securitization that bypasses them entirely. They need more profit opportunities rather than fewer. Credit evaluation and monitoring is probably the expertise in which they enjoy the greatest comparative advantage over their competitors. Thus they would be seriously injured by further restraints on their participation in the burgeoning sector of business finance. Moreover, restricting domestic bank and thrift participation in the financing of corporate restructuring

would hardly impede the trend, just divert it into less visible and manageable channels.

It is directly on large corporations that mandatory capital standards need to be imposed. Small firms would be exempt since they do not contribute materially to the systemic problem. I have in mind a financial ratio approach similar to that already applied by lenders and bond rating agencies. The equity requirement should be gentle—I visualize less than 1 per cent of the regulated universe in initial violation—but satisfiable only by pure equity.

The role prescribed for these requirements is emphatically collective rather than particular. The notion of capital as a form of "coinsurance" that prompts owners to take early heed of an enterprise's difficulties is useful only when a firm suffers reverses peculiar to itself. When the problems are macroeconomic and threaten many firms at the same time, each firm's effort to save itself merely worsens the general plight. The object of equity regulation is to compel a buffer such that firms will be "forced," as it were, to survive a general downturn on their own resources, notwithstanding their inclination to become public welfare cases. Of course, to avoid keeping the fire engine locked up while the city burns, the authorities must be allowed to lower the requirements when they see fit, but only across the board for macroeconomic reasons, not for individual cases.

The required ratios would have to be set at different levels for different firms, depending on their size and industry. It long has been known that debt-equity and other financial ratios differ according to industry and size of firm. (I was hardly the first to show this in my antediluvian 1960 Ph.D. dissertation, done without benefit of computer or even calculator. Kopcke has done it in sophisticated and elegant fashion in a recent article in the *New England Economic Review*.) A certain arbitrariness is unavoidable, but it would hardly be greater than that already involved in the setting of bond ratings by the private rating agencies. Accountants tell me that the IRS already applies such norms to small corporations to avoid abuse of interest deductibility. For large companies, the rating agencies routinely collect and assess the relevant data. Thus mandatory capital standards would involve no great departure from precedent or novelty in terms of reporting and enforcement.

The twofold penalty for noncompliance would be simple and automatic. The lesser penalty would be the withdrawal of the tax advantage for the excess debt—the interest would be treated as though it were dividends. This would limit the tax incentive for equity retirement without radically revising the ecology of our tax system. But in many cases this would not be an adequate deterrent. The more potent penalty to be applied would be the compulsory dismissal of senior

management, with forfeiture of equity entitlements, golden parachutes, and the like.

To Sum Up

The replacement of pure equity by instruments having prominent debt attributes is helpful in the reorganization and toughening of our economy. The incentive structure, however, is such that the process is not adequately self-disciplining. It parallels our experience with depositories and is breeding an even greater systemic risk. Monetary and fiscal policy is inhibited. Farflung and politically damaging bailouts may eventually be triggered.

An additional economic tool is needed for the separate task of protecting the economy from such systemic risk. Equity capital requirements for larger corporations are proposed as a simple, effective, and market-oriented device. Such requirements seem a rather nonintrusive way to check a trend that, unconstrained, may lead to the backdoor socialization of the economy.

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