

ON FINANCIAL CONTRACTING

An Analysis of Bond Covenants*

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With risky debt outstanding, stockholder actions aimed at maximizing the value of their equity claim can result in a reduction in the value of both the firm and its outstanding bonds. We examine ways in which debt contracts are written to control the conflict between bondholders and stockholders. We find that extensive direct restrictions on production/investment policy would be expensive to employ and are not observed. However, dividend and financing policy restrictions are written to give stockholders incentives to follow a firm-value-maximizing production/investment policy. Taking into account how contracts control the bondholder-stockholder conflict leads to a number of testable propositions about the specific form of the debt contract that a firm will choose.

1. Introduction and summary

The conflict of interest between the firm's bondholders and its stockholders has been discussed by a number of authors. For example, Fama/Miller (1972, p. 179) indicate that under certain circumstances 'it is easy to construct examples in which a production plan that maximizes shareholder wealth does not maximize bondholder wealth, or vice versa'.¹ Citing an extreme case of the bondholder-stockholder conflict, Black (1976) points out that 'there is no easier way for a company to escape the burden of a debt than to pay out all of its assets in the form of a dividend, and leave the creditors holding an empty shell'.

In this paper, we examine how debt contracts are written to control the bondholder-stockholder conflict. We investigate the various kinds of bond covenants which are included in actual debt contracts. A bond covenant is a provision, such as a limitation on the payment of dividends, which restricts the firm from engaging in specified actions after the bonds are sold.

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¹See also, Modigliani/Miller (1958, p. 293), Black/Cox (1976), Jensen/Meckling (1976), Miller (1977a), and Black/Miller/Posner (1978).

Our description of the specific provisions in debt contracts is based primarily on an American Bar Foundation compendium entitled *Commentaries on Indentures*. This volume contains both the standardized provisions which are included in the debt contract (the 'boilerplates') and a practitioner-oriented discussion of their use.

1.1. Sources of the bondholder-stockholder conflict

Corporations are 'legal fictions which serve as a nexus for a set of contracting relationships among individuals'.² To focus on the contract between the bondholders and the corporation, we assume that costs of enforcing other contracts are zero. For example, we assume that contracts between stockholders and managers costlessly induce managers to act as if they own all the firm's equity.

The corporation has an indefinite life and the set of contracts which comprise the corporation evolves over time: as the firm's investment opportunity set changes decisions are made about the real activities in which the firm engages and the financial contracts the firm sells. With risky bonds outstanding, management, acting in the stockholders' interest, has incentives to design the firm's operating characteristics and financial structure in ways which benefit stockholders to the detriment of bondholders. Because investment, financing, and dividend policies are endogenous, there are four major sources of conflict which arise between bondholders and stockholders:

Dividend payment. If a firm issues bonds and the bonds are priced assuming the firm will maintain its dividend policy, the value of the bonds is reduced by raising the dividend rate and financing the increase by reducing investment. At the limit, if the firm sells all its assets and pays a liquidating dividend to the stockholders, the bondholders are left with worthless claims.

Claim dilution. If the firm sells bonds, and the bonds are priced assuming that no additional debt will be issued, the value of the bondholders' claims is reduced by issuing additional debt of the same or higher priority.

Asset substitution. If a firm sells bonds for the stated purpose of engaging in low variance projects³ and the bonds are valued at prices commensurate

²Jensen/Meckling (1976, p. 310).

³The importance of the variance rate is derived from the option pricing analysis of Black/Scholes (1973). In section A.1 of the appendix we discuss the determinants of the value of a bond issue where the bonds are single-payment contracts, and the market is efficient and competitive, without transactions costs, information costs, other agency costs, or taxes. The option pricing analysis assumes that the value of the firm will be independent of its financial structure. Our concern in this paper is with a world in which covenants can change the value of the firm. Hence a critical assumption of the option pricing analysis is violated; the value of the firm will, in general, be a function of the covenants which are offered. The option pricing

with that low risk, the value of the stockholders' equity rises and the value of the bondholders' claim is reduced by substituting projects which increase the firm's variance rate.⁴

Underinvestment. Myers (1977) suggests that a substantial portion of the value of the firm is composed of intangible assets in the form of future investment opportunities. A firm with outstanding bonds can have incentives to reject projects which have a positive net present value if the benefit from accepting the project accrues to the bondholders.

The bondholder-stockholder conflict is of course recognized by capital market participants. Rational bondholders recognize the incentives faced by the stockholders. They understand that after the bonds are issued, any action which increases the wealth of the stockholders will be taken. In pricing the bond issue, bondholders make estimates of the behavior of the stockholders, given the investment, financing, and dividend policies available to the stockholders. The price which bondholders pay for the issue will be lower to reflect the possibility of subsequent wealth transfers to stockholders.⁵ The pricing of the bond issue is discussed in more detail in the appendix.

1.2. *Control of the bondholder-stockholder conflict:*

The competing hypotheses

There seems to be general agreement within the finance profession that the bondholder-stockholder relationship entails conflict and that the prices in security markets behave as if all security-holders form rational expectations about the stockholders' behavior after the bonds are issued. However, there is disagreement about whether the total value of the firm is influenced by the way in which the bondholder-stockholder conflict is controlled. There are

analysis does not address the issue of the endogeneity of the stockholders' behavior because variables such as the value of the firm's assets or the variance rate are treated as fixed rather than as decision variables. Therefore, the implications drawn from the option pricing model are only suggestive. In section A.2 of the appendix, we suggest how the endogeneity of investment policy affects the optimal choice of financial structure and the value of the firm's financial claims.

⁴The mere exchange of low-risk assets for high-risk assets does not alter the value of the firm if both assets have the same net present values. However, stockholders will have incentives to purchase projects with negative net present values if the increase in the firm's variance rate from accepting those projects is sufficiently large. Even though such projects reduce the total value of the firm, the value of the equity rises.

⁵Similarly, the value of the common stock at the time the bonds are issued will be higher to reflect possible transfers which shareholders will be able to effect. However, this is not to suggest that there is always a positive price at which the bonds can be sold. If the probability of a complete wealth transfer to stockholders prior to required payments to bondholders is 1, then the bonds will sell for a zero price.

two competing hypotheses. We call them the Irrelevance Hypothesis and the Costly Contracting Hypothesis.

1.2.1. *The Irrelevance Hypothesis*

The Irrelevance Hypothesis is that the manner of controlling the bondholder–stockholder conflict does not change the value of the firm.

Irrelevance under a fixed investment policy. In the Modigliani/Miller (1958) or Fama/Miller (1972) models the firm's investment policy is assumed fixed.⁶ As long as the firm's total net cash flows are fixed, the value of the firm will not be changed by the existence or non-existence of protective covenants; with fixed cash flows, any gain which covenants give bondholders is a loss to stockholders, and vice versa. Covenants merely alter the distribution of a set of payoffs which is fixed to the firm's claimholders as a whole, and the choice of specific financial contracts is irrelevant to the value of the firm.

Irrelevance when investment policy is not fixed. Dividend payout, asset substitution, and underinvestment all represent potential opportunities for wealth transfer to stockholders. When these opportunities are available, the firm's investment policy cannot be regarded as fixed because it is likely to be altered by the presence of risky debt. The total value of the firm could be reduced if stockholders engage in actions which maximize the value of their own claims, but not the total value of the firm. However, even if investment policy cannot be regarded as fixed, mechanisms other than covenants exist which could be sufficient to induce the firm's stockholders to choose a firm-value-maximizing production/investment policy.

The forces exerted by external markets could induce the stockholders to maximize the value of the firm. Long (1973) suggests that the firm will accept all projects with a positive net present value if recapitalization is costless. Fama (1978a) argues that if takeovers are costless, the firm's owners always have an incentive to maximize the value of the firm. Additionally, ongoing firms have other incentives to follow a value-maximizing policy. Cases can be constructed in which a firm with a long history of deviating from such a policy in order to maximize only shareholder wealth will be worth less than it would have, had a value-maximizing policy been followed and expected to continue.

Ownership of the firm's claims could be structured in a way which controls the stockholders' incentive to follow a strategy which does not maximize the total value of the firm. Galai/Masulis (1976) suggest that if all investors hold equal proportions of both the firm's debt and the firm's equity

⁶The mechanism by which this fixity occurs is not well specified. However, the assumption of zero transactions costs in these models suggests that contractual provisions which fix investment policy and control the bondholder–stockholder conflict can be costlessly written and enforced.

issues, wealth redistributions among claimholders leave all investors indifferent. In such a case, bondholder-stockholder conflict arising over investment policy is costlessly controlled, and, even with risky debt, the stockholders will still follow a firm-value-maximizing strategy.

Thus, even when the firm's investment policy is not fixed, under the Irrelevance Hypothesis the stockholders' behavior is not altered by the presence of the bondholder-stockholder conflict. The influence of external markets or the possibility of restructuring the firm's claims implies that the choice of financial contracts is irrelevant to the value of the firm.

1.2.2. The Costly Contracting Hypothesis

The Costly Contracting Hypothesis is that control of the bondholder-stockholder conflict through financial contracts can increase the value of the firm. Like the Irrelevance Hypothesis, the Costly Contracting Hypothesis recognizes the influence which external markets and the possibility of recapitalization exert on the firm's choice of investment policy. However, this hypothesis presupposes that those factors, while controlling to some extent the bondholder-stockholder conflict, are insufficient to induce the stockholders to maximize the value of the firm rather than maximizing the value of the equity. The Costly Contracting Hypothesis underlies the work of Jensen/Meckling (1976), Myers (1977), and Miller (1977a).

Financial contracting is assumed to be costly. However, bond covenants, even if they involve costs, can increase the value of the firm at the time bonds are issued by reducing the opportunity loss which results when stockholders of a levered firm follow a policy which does not maximize the value of the firm. Furthermore, in the case of the claim dilution problem (which involves only a wealth transfer), if covenants lower the costs which bondholders incur in monitoring stockholders, the cost-reducing benefits of the covenants accrue to the firm's owners. With such covenants, the firm is worth more at the time the bonds are issued.

Under the Costly Contracting Hypothesis, there is a unique optimal set of financial contracts which maximizes the value of the firm. Note, however, that the bondholder-stockholder conflict would be resolved and its associated costs driven to zero without bond covenants if the firm never issued any risky debt. But for the firm to follow such a policy is costly if it is optimal to have risky debt in the firm's capital structure. Thus, the Costly Contracting Hypothesis presupposes that there are benefits associated with the inclusion of risky debt. Others have suggested benefits associated with issuance of risky debt which relate to, for example, (1) information asymmetries and signalling [Stiglitz (1972) and Ross (1977)], (2) taxes [Modigliani/Miller (1958, 1966)], (3) agency costs of equity financing [Jensen/Meckling (1976)], (4) differential transactions and flotation costs, and (5) unbundling of riskbearing and capital ownership [Fama (1978b)]. We do

not address the issue of the exact nature of the benefit from the issuance of risky debt.

1.3. Evidence provided by an examination of bond covenants

In this paper, we use the data base provided by the *Commentaries* to distinguish between the Irrelevance and the Costly Contracting Hypotheses. Much of our evidence is qualitative rather than quantitative. Many social scientists are reluctant to consider such observations as evidence. However, qualitative evidence such as that provided by the *Commentaries* is frequently employed in the social sciences and in particular the property rights/economic analysis of law literature [see Alchian/Demsetz (1972), Cheung (1973), Coase (1960), Demsetz (1967), Manne (1967), and Posner (1972)]. Furthermore, qualitative evidence appears to have been instrumental in the development of the natural sciences [e.g., Darwin (1859)].⁷

Observation of persisting institutions represents important empirical evidence. However, we must specify precisely the nature of the evidence afforded by the observations under a particular hypothesis. After all, evidence (whether qualitative or quantitative) is useful only if it distinguishes among competing hypotheses,⁸ what separates good empirical evidence from bad is not whether it can be reduced to numbers, but whether it increases our knowledge of how the world functions.

Debt covenants are a persistent phenomenon. They have been included in debt contracts for hundreds of years,⁹ and over time the corporate debt contract which contains them has evolved into 'undoubtedly the most involved financial document that has been devised'.¹⁰ The covenants discussed in *Commentaries* are representative of the covenants found in actual practice. As discussed by Rodgers (1965) and in the preface to the *Commentaries*, specific sections of the *Commentaries* were written by those considered to be the leading practitioners in their field. To check the correspondence between *Commentaries* and observed contractual provisions, we selected a random sample of 87 public issues of debt which were

⁷Darwin is perhaps the most familiar example; however, it is not the best. Although Darwin presents no quantitative evidence to support his hypotheses, his discussions are typically phrased in quantitative terms, referring to testable propositions about population sizes, etc. However, other areas of biology were developed totally without quantitative evidence. For example, see von Baer's work on embryology, Barnard's work in physiology, and Cuvier's work on taxonomy. For a general description of the development of the science of biology, see Coleman (1971).

⁸This proposition is well established in the philosophy literature. See Kuhn (1970), Nagel (1961), and Popper (1959).

⁹Rodgers (1965) discusses the evolution of debt contracts; he also discusses the history of the American Bar Foundation's Corporate Trust Indenture Project, under which the *Commentaries* were written.

¹⁰Kennedy (1961, p. 1).

registered with the Securities and Exchange Commission between January, 1974 and December, 1975. The standardized provisions of the type discussed in *Commentaries* are used frequently: 90.8 percent of the bonds contain restrictions on the issuance of additional debt, 23.0 percent have restrictions on dividend payments, 39.1 percent restrict merger activities, and 35.6 percent constrain the firm's disposition of assets. Furthermore, we found that when a particular provision is included, a boilerplate from *Commentaries* is used almost exclusively.

It seems reasonable that the covenants discussed in *Commentaries* have not arisen merely by chance; rather, they take their current form and have survived because they represent a contractual solution which is efficient from the standpoint of the firm.¹¹ As Alchian (1950) indicates, 'success (survival) accompanies relative superiority';¹² and 'whenever successful enterprises are observed, the elements common to those observed successes will be associated with success and copied by others in their pursuit of profits or success'.¹³ Hence the *Commentaries* represents a powerful piece of evidence on efficient forms of the financial contract.

However, Miller (1977b, p. 273) indicates an important constraint on the use of this evidence: 'The most that we can safely assert about the evolutionary process underlying market equilibrium is that harmful heuristics, like harmful mutations in nature, will die out. Neutral mutations that serve no function, but do no harm, can persist indefinitely.' In addition to observing the persistence of covenants, we must demonstrate that the covenants involve out-of-pocket or opportunity costs for the firm, since the mere existence of covenants is consistent with both the Irrelevance and the Costly Contracting Hypotheses. But if covenants are costly, as we find in this paper, we must reject the Irrelevance Hypothesis. Similarly, the existence of the costly incentive-related covenants we discuss is inconsistent with the argument that external market forces and the possibility of restructuring the firm's claims provide a sufficient incentive for stockholders to follow a firm-value-maximizing policy. On the other hand, costly incentive-related covenants are exactly what would be expected under the Costly Contracting Hypothesis.

Given that the costs of restrictive covenants are positive, an important question is whether those costs are economically significant. The costs of particular covenants cannot easily be measured, and we present no direct evidence on the dollar magnitude of the costs. In a number of instances we use the assumption that such costs are important to generate testable propositions about the firm's capital structure. Although the evidence on the

¹¹See Alchian (1950) and Stigler (1958) for a discussion of the survivorship principle.

¹²Alchian (1950, p. 213).

¹³Alchian (1950, p. 218).

importance of the bondholder–stockholder conflict is by no means conclusive, in several cases where the predictions of the analysis have been tested, the evidence is consistent with the theory. It appears that the Costly Contracting Hypothesis, which explains how firms reduce the costs of the bondholder–stockholder conflict, helps to account for the variation in debt contracts across firms. In contrast, the Irrelevance Hypothesis, while consistent with any observed set of contracts, yields no predictions about the form of the debt contract.

1.4. Overview of the paper

Observed debt covenants are discussed in section 2. To facilitate the discussion, observed covenants are grouped into four categories: production/investment covenants, dividend covenants, financing covenants, and bonding covenants. We use a common format for the discussion of each covenant; a particular type of covenant is first described, and its impact then analyzed.

Covenants which directly restrict the shareholders' choice of production/investment policy, are discussed in section 2.1. These covenants impose restrictions on the firm's holdings of financial investments, on the disposition of assets, and on the firm's merger activity. The observed constraints place few specific limitations on the firm's choice of investment policy. However, it is important to realize that, because of the cash flow identity, investment, dividend, and financing policy are not independent; they must be determined simultaneously. Thus, covenants which restrict dividend and financing policy also restrict investment policy.

Bond covenants which directly restrict the payment of dividends are considered in section 2.2. The dividend restriction does not take the form of a constant dollar limitation. Instead, the maximum allowable dividend payment is a function of both accounting earnings and the proceeds from the sale of new equity. The analysis suggests that the dividend covenant places an implicit constraint on the investment policy of the firm and provides the stockholders with incentives to follow a firm-value-maximizing production/investment policy.

Financing policy covenants are discussed in section 2.3. These covenants restrict not only the issuance of senior debt, but the issuance of debt of any priority. In addition, the firm's right to incur other fixed obligations such as leases is restricted. These restrictions appear to reduce the underinvestment incentives discussed by Myers (1977). In section 2.4, convertibility, callability, and sinking fund provisions are also examined. These provisions appear to specify payoffs to bondholders in a way which also controls bondholder–stockholder conflict.

In section 2.5, we analyze covenants which specify bonding activities –

expenditures made by the firm which control the bondholder–stockholder conflict. These bonding activities include the provision of audited financial statements, the specification of accounting techniques, the required purchase of insurance, and the periodic provision of a statement, signed by the firm's officers, indicating compliance with the covenants.

Just as the covenants described in section 2 are persistent phenomena, so are the institutions for enforcing these contractual restrictions. The enforcement of bond covenants within the existing institutional arrangements is the subject of section 3. The Trust Indenture Act of 1939 restricts the provisions of the debt contract for public issues in a way which makes the enforcement of tightly restrictive covenants very expensive. Another enforcement cost emanates from the legal liability which bondholders incur when they exercise control over the firm. Default remedies which are available to the firm, and their associated costs, are also discussed.

Our conclusions are presented in section 4.

2. A description and analysis of bond covenants

We group observed covenants into four categories: production/investment covenants, dividend covenants, financing covenants, and bonding covenants. Our discussion of the covenants covers all the restrictions reported in *Commentaries*; we have not singled out only particular types of covenants for discussion.¹⁴

2.1. Restrictions on the firm's production/investment policy

The stockholders' production/investment decisions could be directly constrained by explicitly specifying the projects which the firm is allowed to undertake. Alternatively, if it were costless to enforce, the debt contract could simply require the shareholders to accept all projects (and engage in only those actions) with positive net present values. Although certain covenants directly restrict the firm's investment policy, debt contracts discussed in *Commentaries* do not generally contain extensive restrictions of either form.

2.1.1. Restrictions on investments

Description. Bond covenants frequently restrict the extent to which the firm can become a claimholder in another business enterprise. That restriction, known as the 'investment' restriction, applies to common stock investments, loans, extensions of credit, and advances.¹⁵ Alternative forms of this cov-

¹⁴However, note that we do not discuss the standard contractual provisions governing procedural matters (e.g., face amount, redemption procedure) which are necessary to define the firm's obligations as debt.

¹⁵Investments in direct obligations of the United States of America, prime commercial paper, and certificates of deposit are frequently excepted *Commentaries* (p. 461, sample covenant 1A).

enant suggested in *Commentaries* either (1) flatly prohibit financial investments of this kind, (2) permit these financial investments only if net tangible assets meet a certain minimum, or (3) permit such investments subject to either an aggregate dollar limitation or a limitation representing a pre-specified percentage of the firm's capitalization (owners' equity plus long-term debt).

Analysis. We suggest that stockholders contractually restrict their ability to acquire financial assets in order to limit their ability to engage in asset substitution after the bonds are issued.^{16,17} However, the inclusion of the investment covenant imposes opportunity costs. First, if there are economies of scale in raising additional capital, or costs associated with changing dividends, then allowing the purchase of financial assets can reduce these costs.¹⁸ Second, if a firm is involved in merger activities, the purchase of equity claims of the target firm prior to the merger can also provide benefits. Thus, the Costly Contracting Hypothesis predicts that bond contracts of firms involved in merger activities, for which the opportunity cost of restricting 'investments' is therefore high, will contain less restrictive investment covenants. However, our analysis does not predict which of the above forms the investment restriction will take.

2.1.2. *Restrictions on the disposition of assets*

Description. 'The transfer of the assets of the obligor substantially as an entirety' can be restricted by a standard boilerplate.¹⁹ The contract can also require that the firm not 'otherwise than in the ordinary course of business, sell, lease, transfer, or otherwise dispose of any substantial part of its properties and assets, including...any manufacturing plant or substantially all properties and assets constituting the business of a division, branch, or other unit operation'.²⁰ Another restriction is to permit asset disposition only

¹⁶Given that stockholders of most corporations are subject to double taxation of their returns, financial assets are negative net present value projects whose acquisition reduces the value of the firm. However, shareholders will have an incentive to purchase such assets if acquiring them increases the variability of the firm's cash flows by enough to offset the reduction in the value of the firm. Thus, the investments covenant raises the price to the stockholders of increasing the variability of the firm's cash flows.

¹⁷An alternative explanation for the investment restriction is that it reduces the conflict between managers and stockholders. The investment restriction typically applies to 'any person' Hence managers are restricted from making loans to themselves, as well as from investing the firm's resources in firms which the managers own. We cannot reject this explanation for the investment restriction. However, it is not clear why bondholders have a comparative advantage (over stockholders) in policing managerial behavior of this form.

¹⁸That the purchase of short-term riskless assets is often allowed under the investments restriction is consistent with this explanation. Stockholders cannot increase the variability of cash flows with riskless assets. Furthermore, Treasury Bills dominate cash, which has a zero pecuniary return.

¹⁹*Commentaries* (p. 423).

²⁰*Commentaries* (p. 427, sample covenant 2).

up to a fixed dollar amount, or only so long as (1) the proceeds from the sale are applied to the purchase of new fixed assets, or (2) some fraction of the proceeds is used to retire the firm's debt.²¹

Analysis. The Costly Contracting Hypothesis suggests that restrictions on the sale of substantial units of the firm's assets are observed because, in general, the proceeds if assets are sold piecemeal will be less than if sold as a going concern.²² By imposing the higher cost of piecemeal sale, this covenant also raises the cost to stockholders of substituting variance increasing assets for those currently owned by the firm.

One cost associated with flat prohibitions on the sale of particular assets rises from the fact that the firm is not permitted to divest itself of those assets whose value to others is greater than the value to itself. Thus the restriction which permits asset sale if the proceeds are applied to the purchase of new fixed assets lowers this opportunity cost. However, a provision which permits such asset exchange is costly because it allows for the possibility of obtaining variance increasing negative net present value assets in the exchange. The stipulation that a fraction of the proceeds from the sale of assets be used for the retirement of the firm's debt makes asset substitution more expensive for stockholders by requiring a concurrent increase in the coverage on, and thus the value of, the outstanding debt.

2.1.3. Secured debt

Description. Securing debt gives the bondholders title to pledged assets until the bonds are paid in full. Thus, when secured debt is issued the firm cannot dispose of the pledged assets without first obtaining permission of the bondholders.

Analysis. We suggest that the issuance of secured debt lowers the total costs of borrowing by controlling the incentives for stockholders to take projects which reduce the value of the firm; since bondholders hold title to the assets, secured debt limits asset substitution. Secured debt also lowers administrative costs and enforcement costs by ensuring that the lender has clear title to the assets and by preventing the lender's claim from being jeopardized if the borrower subsequently issues additional debt. In addition, collateralization

²¹Such provisions typically apply to the retirement of the firm's funded (i.e., long-term) debt. The covenant in a particular bond issue requires that *all* the firm's debt be retired on a prorated basis. To require that only the particular bond issue containing the covenant be retired might well violate the firm's other debt agreements.

²²Given that selling substantial portions of the firm's assets can be illegal under, for example, the Uniform Fraudulent Conveyance Act, the standard boilerplate would seem redundant. Our theory does not explain the redundancy of the terms of the bond contract and the constraints implied by the legal system. But in the case of this boilerplate, we suggest that, should the assets of the firm be sold, subjecting the firm's managers to civil and criminal liability alone is a more costly remedy than allowing the bondholders to put the firm in default.

reduces expected foreclosure expenses because it is less expensive to take possession of property to which the lender already has established title.

However, secured debt involves out of pocket costs (e.g., required reports to the debt-holders, filing fees, and other administrative expenses). Securing debt also involves opportunity costs by restricting the firm from potentially profitable dispositions of collateral.

The Costly Contracting Hypothesis leads to two predictions about the use of secured debt. First, if the firm goes into bankruptcy proceedings and the collateral is judged necessary for the continued operation of the firm, the bankruptcy judge can prohibit the bondholders from taking possession of the property. Thus for firms where liquidation is more likely than reorganization (e.g., for smaller firms), the issuance of secured debt will be greater. Second, we would expect more frequent use of secured debt the less specialized the firm's resources. To the extent that assets (such as a patent right) are highly specialized and firm-specific, their value is greater to the firm than in the market place. Consequently, it will be costly to the stockholders if they dispose of such assets in order to engage in asset substitution. The more specialized the assets, the more costly is asset substitution to stockholders, the tighter the implicit constraint on asset sale, and thus the less likely is the use of secured debt.²³

2.1.4. *Restrictions on mergers*

Description. Some indenture agreements contain a flat prohibition on mergers. Others permit the acquisition of other firms provided that certain conditions are met. For example, *Commentaries* suggests restrictions in which the merger is permitted only if the net tangible assets of the firm, calculated on a post-merger basis, meet a certain dollar minimum, or are at least a certain fraction of long-term debt. The merger can also be made contingent on there being no default on any indenture provision after the transaction is completed.

The acquisition and consolidation of the firm into another can be permitted subject to certain requirements. For example, the corporation into which the company is merged must assume all of the obligations in the initial indenture. Article 800 of the American Bar Foundation *Model Debenture Indenture Provisions* also requires that there be no act of default after completion of the consolidation, and that the company certify that fact through the delivery to the trustee of an officer's certificate and an opinion of counsel.

Analysis. Since the stockholders of the two firms must approve a merger, the market value of the equity claims of both the acquired and acquiring firm must be expected to rise or the merger will not be approved by

²³For a further discussion of secured debt, see Scott (1977) and Smith/Warner (1979).

stockholders of the respective firms.²⁴ A merger between two firms usually results in changes in the value of particular classes of outstanding claims because both the asset and liability structure of the resulting firm differ from that of the predecessor firms. The effects of a merger on the value of particular claims depend upon: (1) the degree of synergy brought about by the merger, (2) the resources consumed in accomplishing the merger, (3) the variance rates of the pre-merger firms' cash flows, (4) the correlation coefficient between the merged firms' cash flows, and (5) the capital structure (i.e., ratio of face value of debt to market value of all claims) of the respective firms. A merger leaves the value of outstanding debt claims unaffected if (1) the merger involves no synergy, (2) there are no transactions costs, (3) the pre-merger firm's cash flows have equal variance rates, (4) the correlation coefficient between the merged firms' cash flows is +1, and (5) the pre-merger firms have the same capital structure.

With no contractual constraints against mergers, the value of the bondholders' claims can be reduced due to the effect of a difference in variance rates or a difference in capital structures. Our analysis implies, then, that merger restrictions limit the stockholders' ability to use mergers to increase either the firm's variance rate or the debt to asset ratio to the detriment of the bondholders. Note that to the extent that synergistic mergers are prevented by this covenant, the firm suffers an opportunity loss.²⁵

2.1.5. *Covenants requiring the maintenance of assets*

Description. The covenants we have discussed constrain production/investment policy by prohibiting certain actions. However, the firm's operating decisions can also be limited by *requiring* that it take certain actions, that it invest in certain projects, or hold particular assets. Examples of such covenants are those requiring the maintenance of the firm's properties and maintenance of the firm's working capital (i.e., current assets less current liabilities).²⁶ *Commentaries* offers covenants which require the firm to maintain working capital above a certain minimum level. Frequently, activities

²⁴This is consistent with the evidence of Dodd/Ruback (1977) and Bradley (1978). They find that, on average, there is positive abnormal performance for common stocks of both acquiring and acquired firms.

²⁵As we discuss in section 2.3, the indenture agreements typically require that the firm comply with one or more tests (such as minimum ratios of net tangible assets to funded debt) in order to issue additional debt. According to *Commentaries*, when additional debt obligations are incurred through a merger, for purposes of the tests, the debt incurred can be treated as having been issued as of the merger. Thus, financing policy covenants can be employed to control mergers.

²⁶Another restriction on increases in the risk of the firm's activities is a covenant requiring that the firm stay in the same line of business. For example, the Associated Dry Goods Credit Corporation Notes of 1983 require that the firm 'not engage in any business other than dealing in Deferred Payment Accounts'. This covenant thus makes it more costly to engage in asset substitution.

such as mergers are made contingent upon the maintenance of working capital

Analysis. While a covenant can require that the firm maintain its properties, such a covenant will not have much impact if it is expensive to enforce. However, if the maintenance is performed by an independent agent, enforcement costs are expected to be lower and such a restriction will be effective. For example, in the shipping industry, where maintenance services are typically provided through third parties, bond covenants frequently explicitly include service and dry-docking schedules in the indenture.

We suggest that the working capital requirement is included because any violation of the covenant provides a signal to the lender. This signal can result in renegotiation of the debt contract, an alternative preferable to default when bankruptcy is more costly than renegotiation. This hypothesis is consistent with the interpretation of the working capital covenant in *Commentaries* (p. 453): 'If a breach of the covenant occurs, the lender is in a position to use this early warning to take whatever remedial action is necessary.'

2.1.6. Covenants which indirectly restrict production/investment policy

Stockholder use (or misuse) of production/investment policy frequently involves not some action, but the failure to take a certain action (e.g., failure to accept a positive net present value project). Because of this, investment policy can be very expensive to monitor, since ascertaining that the firm's production/investment policy does not maximize the firm's market value depends on magnitudes which are costly to observe. Solutions to this problem are not obvious. For example, if the indenture were to require the bondholders (rather than the stockholders) to establish the firm's investment policy, the problem would not be solved; the bondholders, acting in their self interest, would choose an investment policy which maximized the value of the bonds, not the value of the firm.²⁷ In addition, there are other costs associated with giving bondholders a role in establishing the firm's investment policy. For instance, as we discuss in section 3, legal costs can be imposed on bondholders if they are deemed to have assumed control of the corporation.

However, direct restrictions on the stockholder's choice of production/investment policy are only one way to limit the projects in which the firm can engage. Covenants constraining the firm's dividend and financing policies can also be written in a way which serves a similar function, since the firm's production/investment, dividend, and financing policies are linked through the cash flow identity. If direct restrictions on production/investment policy

²⁷Jensen/Meckling refer to this as the symmetry property.

were sufficiently expensive to enforce, dividend and financing policy covenants would be the only efficient way of constraining the firm's actions.

2.2. Bond covenants restricting the payment of dividends

Description. Cash dividend payments to stockholders, if financed by a reduction in investment, reduce the value of the firm's bonds by decreasing the expected value of the firm's assets at the maturity date of the bonds, making default more likely. Thus, it is not surprising that bond covenants frequently²⁸ restrict the payment of cash dividends to shareholders.²⁹ Since the payment of dividends *in cash* is just one form which distributions to stockholders can take, actual dividend covenants reflect alternative possibilities. For example, if the firm enters the market and repurchases its own stock the coverage on the debt decreases in exactly the same way as it would if a cash dividend were paid. The constraints discussed in *Commentaries* relate not only to cash dividends, but to 'all distributions on account of or in respect of capital stock ... whether they be dividends, redemptions, purchases, retirements, partial liquidations or capital reductions and whether in cash, in kind, or in the form of debt obligations of the company'.³⁰

The dividend covenant usually establishes a limit on distributions to stockholders by defining an inventory of funds available for dividend payments over the life of the bonds.³¹ The inventory is not constant; rather, it is allowed to change as a function of certain variables whose values can be influenced by the stockholders. Typically, the inventory of funds available for the payment of dividends in quarter τ , D_τ^* , can be expressed as

$$D_\tau^* = k \left(\sum_{t=0}^{\tau} E_t \right) + \left(\sum_{t=0}^{\tau} S_t \right) + F - \left(\sum_{t=0}^{\tau-1} D_t \right), \quad (1)$$

²⁸Kalay (1979) reports that in a sample of 150 randomly selected industrial firms, every firm had a dividend restriction in at least one of its debt instruments.

²⁹According to Henn (1970, pp. 648-656) most states have also limited the source of dividends to legally prescribed funds. Various laws define the funds legally available for dividends in terms of (1) earned surplus, (2) net profits or net earnings, (3) non-impairment of capital, (4) insolvency, or some combination. Directors are often made liable by statute (and possibly subject to criminal penalties) for dividends paid out of funds not legally available. Even apart from statutes expressing such limitation, distribution of dividends which would render the corporation insolvent is probably wrongful in most jurisdictions on principles of the law of creditors' rights.

³⁰*Commentaries* (p. 405). It should be noted that the problem of constraining the firm's investment in financial assets, which we discussed in section 2.1, is sometimes handled within the dividend covenant. Distributions restricted under the dividend covenant can be defined to include purchases of securities by the firm. Under this definition, the stockholders of the firm can choose to hold any amount of financial investments so long as they give up an equal amount of dividends.

³¹Kennedy (1961, p. 137). In his study of dividend covenants, Kalay (1978) finds that most of them take the form discussed here.

where, for quarter t ,

E_t is net earnings,

S_t is the proceeds from the sale of common stock net of transactions costs,

F is a number which is fixed over the life of the bonds, known as the 'dip',

k is a constant, $0 \leq k \leq 1$.

Hence the inventory of funds is a positive function of the earnings which the firm has accumulated, a positive function of the extent to which the firm has sold new equity claims, and a negative function of the dividends paid since the bonds were issued at $t=0$.

The payment of a dividend is not permitted if its payment would cause the inventory to be drawn below zero. The inventory can become negative if the firm's earnings are negative. In that case, no dividend is permitted. However, stockholders are not required to make up the deficiency.³² Thus the dividend payment in quarter τ , D_τ , must satisfy the constraint

$$D_\tau \leq \max[0, D_\tau^*]. \quad (2)$$

Analysis. This form of dividend covenant has several interesting features. The dividend restriction is not an outright prohibition on the payment of dividends. In fact, the stockholders are permitted to have any level of dividends they choose, so long as the payment of those dividends is financed out of new earnings or through the sale of new equity claims. The dividend covenant acts as a restriction not on dividends *per se*, but on the payment of dividends financed by issuing debt or by the sale of the firm's existing assets, either of which would reduce the coverage on, and thus the value of, the debt.

The dividend covenant described in eqs. (1) and (2) coupled with the cash-flow identity that inflows equal outflows constrain investment policy.³³ The cash-flow identity for the firm can be expressed as

$$D_t + R_t + P_t + I_t \equiv \phi_t + S_t + B_t, \quad (3)$$

where, for quarter t ,

D_t is the dividend paid,

R_t is interest paid,

P_t is debt principal paid,

I_t is new investment,

ϕ_t is the firm's cash flow.

³²Given limited liability, a covenant requiring that a positive balance be maintained in the inventory and that individual shareholders be assessed for deficiencies is probably not enforceable without considerable cost.

³³We would like to thank John Long for suggesting this expositional model and for helpful discussions on this point.

S_t is the proceeds from the sale of equity net of transactions cost,
 B_t is the proceeds from the sale of bonds net of transactions cost.

The firm's cash flow, ϕ_t , can be expressed as³⁴

$$\phi_t \equiv E_t + d_t + R_t + L_t, \quad (4)$$

where, for quarter t ,

E_t is the firm's net earnings,

d_t is depreciation,

L_t is the book value of any assets liquidated.³⁵

Substituting (3) into (4) and solving for D_t yields

$$D_t \equiv E_t + d_t + R_t + L_t - I_t + S_t + B_t - R_t - P_t. \quad (5)$$

To see how the dividend covenant constrains investment policy, consider the simplest case. Assume that an all equity firm sells bonds at par with a covenant that it will issue no additional debt over the life of the bonds (i.e., $B_t = 0$ for $t \neq 0$, and $P_t = 0$ for $t \neq T$). If we also assume that $F \equiv 0$, and $k \equiv 1$, then substituting (5) and (1) into (2) yields the condition for dividends in quarter τ to be positive,

$$B_0 \leq \sum_{t=0}^{\tau} (I_t - L_t - d_t). \quad (6)$$

The right-hand side of (6) is simply the cumulative change in the book value of the firm's assets since the bonds were sold. Thus in this simple case, the dividend covenant requires that for dividends to be paid in the quarter the bonds are issued, investment must be large enough that the net change in the book value of the firm's assets be no less than the net proceeds from the sale of the debt – the firm cannot borrow to pay dividends. The constraint also requires that in subsequent quarters investment be large enough for the book value of the firm's assets to be maintained at that level.

If the assumptions that $k=1$ and $F=0$ are now relaxed, then eq. (6) becomes

$$B_0 + (1 - k) \left(\sum_{t=0}^{\tau} E_t \right) - F \leq \sum_{t=0}^{\tau} (I_t - L_t - d_t). \quad (7)$$

³⁴For purposes of illustration we assume that the accrual is depreciation and that all items other than depreciation, interest payments, and liquidations affect cash flows and earnings in the same way.

³⁵ L_t is defined as the book value of assets liquidated when earnings includes gains or losses on the sale of assets. If such gains or losses are not included in earnings, then L_t is the proceeds from the liquidation.

Setting k between zero and one requires that if the firm has positive earnings, the book value of the assets of the firm must actually increase in order for dividends to be paid.³⁶

By placing a maximum on distributions, the dividend covenant effectively places a minimum on investment expenditures by the owners of the firm, as Myers and Kalay (1979) argue. This reduces the underinvestment problem discussed by Myers, since so long as the firm *has* to invest, profitable projects are less likely to be turned down.

While having a tight dividend constraint controls the stockholders incentives associated with the dividend payout problem, there are several associated costs. An outright prohibition on dividends or allowing dividends but setting k less than one increases the probability that the firm will be forced to invest when it has no available profitable projects. Investment in securities of other firms is not always possible, since purchases of capital market instruments (which in the absence of corporate taxes have zero net present value) are frequently prohibited by the investments covenant we discussed in section 2.1. Even if financial investments are not restricted, Kalay argues that if the firm pays income taxes on its earnings, the taxation of the returns from the financial assets makes them negative net present value projects.³⁷

The tighter restriction on dividends implied by a lower k also increases the stockholders' incentives to engage in asset substitution, and increases the gain to the firm's shareholders from choosing high variance, negative net present value projects. Assume that negative net present value projects generate negative accounting earnings. Then from the first term of eq. (1), the inventory available for dividends will be reduced by taking such a project. The lower the value of k , the smaller the reduction in the inventory. To the extent that dividends transfer wealth to stockholders, the marginal impact of lowering k is thus to increase the gain (or decrease the loss) to shareholders from accepting such projects. However, as we discuss below, a lower k also confers benefits, since it reduces the stockholders' incentive to engage in 'creative accounting' to increase reported earnings.

If it is costly to restrict dividends, not all debt agreements will include a dividend restriction. Dividend covenants would be expected only if there are offsetting benefits. One prediction of our analysis is that the presence of a dividend covenant should be related to the maturity of the debt. Thus, short-

³⁶The value of k is less than 1 in about 20 percent of the dividend covenants which Kalay (1979) examines. According to *Commentaries* (p. 414), the 'dip', F , is equal to about a year's earnings. Kalay finds that the mean value of the dip, as a fraction of earnings, is indeed approximately 1.

³⁷We conjecture that the specification of a positive F in the debt contract is directed at reducing the costs of temporarily having no profitable investment projects and being unable to pay dividends. In spite of the increased payouts it allows, the dip permits a dividend to be paid to shareholders even when earnings are negative and the firm has not sold new equity.

term debt instruments (such as commercial paper) are less likely to contain dividend restrictions than long-term debt; if liquidation of the firm's assets within a short period of time is sufficiently costly to the shareholders, they are better off not selling the firm's assets for cash in order to pay themselves a dividend. This implicit constraint on dividend payout becomes less restrictive the longer the time to maturity of the debt, and the cost-offsetting benefits of an explicit dividend constraint thus become greater as a function of maturity.

Evidence. Kalay develops and tests a number of propositions about how the dividend constraint will be set. He argues that the shareholders' incentive to sell assets for cash is greater the higher the fraction of the firm consisting of debt: the higher that fraction, the greater the potential wealth transfer to stockholders. Consistent with the argument that the dividend constraint involves costs, he finds a significant negative cross-sectional relationship between the dividends which can be paid out under the constraint and the firm's debt/equity ratio.³⁸

Kalay also reports that firms do not always pay out all of the dividends to which they are entitled under the indenture agreement. He argues that firms maintain such an 'inventory of payable funds' because having an inventory reduces the probability that the firm will be unable to pay dividends and thus be forced to invest when there are temporarily no profitable investment projects. However, if stockholders maintain an inventory and fail to pay out all funds available for dividends, wealth transfers from bondholders are foregone. On this basis, Kalay posits that the shareholders' incentive to maintain an inventory is lower the higher the firm's leverage. That proposition is consistent with his finding that there is a significant negative relationship between the firm's debt/equity ratio and the (size adjusted) 'inventory of payable funds'.

2.2.1. *Control of investment incentives when the inventory is negative*

Throughout the above analysis we have assumed that the inventory of funds available for the payment of dividends, D_t^* , is positive. If the firm has been experiencing negative earnings, the inventory can become negative; with a negative inventory, no dividends can be paid. The negative earnings which lead to a dividend prohibition are likely to be associated with a fall in the value of the firm, and an increase in both its debt/equity ratio and the probability of default on its debt. Hence at the times when a dividend

³⁸The effective constraint on dividends cannot be determined without considering dividend covenants across all the firm's bond issues. Kalay treats the tightness of the dividend constraint with this in mind; the negative relationship he postulates is between the amount which can be paid out (adjusted for firm size) under the firm's *most* restrictive dividend constraint and its leverage

prohibition comes into play, the firm is also likely to be faced with greater incentives to engage in asset substitution and claim dilution.

When the firm is doing poorly, the dividend constraint is not capable of controlling the investment and financing policy problem induced by the presence of risky debt. But the direct limitations on production/investment policy we discussed in section 2.1 can limit the stockholders' actions when the inventory for payment of dividends is negative. In addition, financing policy covenants not only address the claim dilution problem, but independently reinforce the effect of the dividend covenant in restricting production/investment policy.

2.3. Bond covenants restricting subsequent financing policy

2.3.1. Limitations on debt and priority

Description. In section 1 we discussed the stockholders' incentives to reduce the value of the outstanding bonds by subsequently issuing additional debt of higher priority, thereby diluting the bondholders' claim on the assets of the firm. Covenants suggested in *Commentaries* limit stockholders actions in this area in one of two ways: either through a simple prohibition against issuing claims with a higher priority, or through a restriction on the creation of a claim with higher priority unless the existing bonds are upgraded to have equal priority. The latter restriction requires, for example, that if secured debt is sold after the issuance of the bonds, the existing bondholders must have their priority upgraded and be given an equal claim on the collateral with the secured debtholders.

In addition to restricting the issuance of debt of higher priority, there are sample covenants in *Commentaries* restricting the stockholders' right to issue any additional debt. Issuance of new debt can be subject to aggregate dollar limitations. Alternatively, issuing debt can be prohibited unless the firm maintains minimum prescribed ratios between (1) net tangible assets and funded (i.e., long-term) debt, (2) capitalization and funded debt, (3) tangible net worth³⁹ and funded debt, (4) income and interest charges (referred to as earnings tests), or (5) current assets and current debt (referred to as working capital tests). There are also provisions requiring the company to be free from debt for limited periods (referred to as 'clean-up' provisions). Combinations of two or more of these limitations are sometimes included in the indenture agreement.

It is important to note the scope of the restrictions imposed through the

³⁹Some definitions of net worth include subordinated debt and thus treat it as equity. Thus the issuance of debt of equal priority is limited, and the constraint on the issuance of junior debt is relaxed. Our theory does not explain which alternative definition of net worth will be appropriate for a given firm.

covenants limiting the issuance of additional debt. In addition to money borrowed, the covenants also apply to other liabilities incurred by the firm. Other debt-like obligations which can be limited by the covenants are: (1) assumptions or guarantees of indebtedness of other parties,⁴⁰ (2) other contingent obligations which are analogous to, but may not technically constitute, guarantees; (3) amounts payable in installments on account of the purchase of property under purchase money mortgages, conditional sales agreements or other long-term contracts; (4) obligations secured by mortgage on property acquired by the company subject to the mortgage but without assumption of the obligations.

Since the claims of the firm in subsidiary corporations are like that of a stockholder, if a subsidiary issues debt or preferred stock the coverage afforded the bondholders of the parent firm is reduced. Thus the limitations on debt usually apply to the debt of the consolidated firm.⁴¹

Analysis. Our analysis suggests that it is generally not optimal to prevent all future debt issues. If, as the firm's opportunity set evolves over time, new investments must be financed by new equity issues or by reduced dividends, then with risky debt outstanding part of the gains from the investment goes to bondholders, rather than stockholders. Those investments increase the coverage on the debt, and reduce the default risk borne by the bondholders. To the extent such reductions are unanticipated, they result in an increase in the value of outstanding bonds at the expense of the stockholders. So a prohibition of all debt issues would reduce the value of the firm because wealth maximizing stockholders would not take all positive net present value projects. The possibility of asset substitution increases the costs of outright prohibition on debt issues and makes variance reducing positive net present value projects less attractive. However, our analysis suggests that contractually agreeing to have *some* degree of restriction on future debt issues is in the interests of the firm's owners. By merely restricting the total amount of *all* debt which can be issued, the perverse investment incentives associated with debt discussed by Myers (1977) are limited.

⁴⁰The third edition of Dewing (1934, p. 105) discusses the Denver Rio Grande Railroad, which is the 'classic case' of a guaranteed bond which brought a severe test of the strength of the guarantor:

'The old Western Pacific Railway was built for strategic reasons in order to complete a Pacific coast extension for the Denver and Rio Grande Railroad – all a part of Gould's contemplated transcontinental railway system. The bonds of the Western Pacific were guaranteed, principal and interest, by the Denver and Rio Grande. When it developed that the Western Pacific failed to earn the interest charges, default occurred, and the Western Pacific passed into the hands of receivers.

The Denver and Rio Grande Railroad, having failed to meet the guarantees, was ordered to pay over to the trustees of the Western Pacific bonds the sum of \$38,000,000. Thereupon the Denver and Rio Grande itself failed.'

⁴¹Borrowing by a subsidiary from the company or another subsidiary is excluded

Financing-policy covenants also impact on investment incentives in other ways. In section 2.1, we discussed the direct limitations on financial investments included in bond covenants. Financial investments can also be restricted through the debt covenant. For example, when debt is limited to a specific percentage of net tangible assets, financial investments are sometimes excluded from the definition of net tangible assets for purposes of the covenant. This definition allows the firm to hold a portion of its assets as financial investments, but requires the firm to reduce the debt and its capital structure to do so, thus controlling the asset substitution problem associated with financial investments.

Financing policy impacts on production/investment policy through the dividend covenant. If the level of outstanding debt changes over the life of the bonds, eq. (6) (which presumes that no additional debt is either issued or repaid) must be modified,

$$\sum_{t=0}^T (B_t - P_t) \leq \sum_{t=0}^T (I_t - L_t - d_t), \quad (8)$$

where

B_t is the proceeds from the sale of bonds net of transactions costs,

P_t is debt principal paid,

I_t is new investment,

L_t is the book value of any assets liquidated,

d_t is depreciation.

The left-hand side of eq. (8) is simply the cumulative change in the book value of the firm's debt since the sale of this bond issue at $t=0$. For dividends to be paid the cumulative change in the book value of the assets must be no less than the cumulative change in the book value of the debt. Thus the stockholders cannot borrow to finance dividend payments.

2.3.2. Limitations on rentals, lease, and sale-leasebacks

Description. *Commentaries* offers alternative restrictions on the stockholders' use of lease or rental contracts. The covenant typically restricts the firm from the sale-leaseback of property owned prior to the date of the indenture.⁴² Some covenants also exclude individual leases or sale-leasebacks below a specified dollar total. Lease payments can also be limited to a fraction of net income. Finally, leasing and renting can be controlled through the debt covenant by capitalizing the lease liability and including it in both

⁴²This restriction sometimes applies only to specific property (e.g., manufacturing property or heavy equipment) or applies except for items specifically exempted (e.g., office space, warehouses, or automobiles). Alternatively, only long-term leases are covered, with a condition that for short-term leases the company discontinue the use of the property after the term of the lease.

the long-term debt definition and asset definitions. In this case, the covenant specifies the procedure for computing the capitalized value of the asset and liability.⁴³

Analysis. Continued use of leased or rented assets by the firm is contingent on making the lease or rental payments. These payments represent liabilities to the firm, and are a claim senior to that of the debtholders: such obligations reduce the value of the outstanding bondholders' claim. For this reason, the Costly Contracting Hypothesis predicts restrictions on the stockholders' subsequent use of leases in the indenture agreement. However, we are unable to explain the specific form which the restriction will take for a particular set of firm characteristics.

2.4. Bond covenants modifying the pattern of payoffs to bondholders

There are several provisions which specify a particular pattern of payoffs to bondholders in a way which controls various sources of stockholder–bondholder conflict of interest.

2.4.1. Sinking funds

Description. A sinking fund is simply a means of amortizing part or all of an indebtedness prior to its maturity. A sinking fund bond is like an installment loan.⁴⁴ In the case of a public bond issue, the periodic payments can be invested either in the bonds which are to be retired by the fund or in some other securities. The sinking fund payments can be fixed, variable or contingent. For the years 1963–1965, 82 percent of all publicly-offered issues included sinking fund provisions.⁴⁵

Analysis. A sinking fund affects the firm's production/investment policy through the dividend constraint. From eq. (8) we see that if a sinking fund is included in the indenture, principal repayment, P_t , will be positive prior to the maturity date of the bond; the book value of the assets of the firm can decline over the life of the bond issue without violating the dividend constraint. A sinking fund reduces the possibility that the dividend constraint will require investment when no profitable projects are available. One potential cost associated with the dividend constraint is thus reduced.

Myers (1977) has suggested that sinking funds are a device to reduce

⁴³See *Commentaries* (p. 440)

⁴⁴In a private placement, the amortization may simply require periodic partial payments to the holder. An alternative to a sinking fund is to provide for serial maturities with part of the issue maturing at fixed dates. This practice is rarely used in the corporate bond market presumably because with fewer identical contracts, maintenance of a secondary market in the bond contracts is more expensive.

⁴⁵See Norgaard/Thompson (1967, p. 31). Note also that in enforcing the Public Utilities Holding Company Act, the SEC requires a sinking fund to be included.

creditors' exposure in parallel with the expected decline in the value of the assets supporting the debt. Myers' analysis implies that sinking funds would be more likely to be included in debt issues (1) the higher the fraction of debt in the capital structure, (2) the greater the anticipated future discretionary investment by the firm and (3) the higher the probability that the project will have a limited lifetime. One industry which illustrates an extreme of the last of these characteristics is the gas pipeline industry. The sinking fund payments required in some gas pipeline debentures are related to the remaining available gas in the field.⁴⁶

Not all debt issues have sinking funds; their exclusion from some contracts can be explained by anticipated costs which sinking funds can impose on the trustee if there is a default. Although the application of sinking fund monies is set forth in the covenant, should default occur the applicable law is not clear.⁴⁷ Even where only one series of bonds is involved, application of funds to the retirement of specific bonds with knowledge of a default might involve participation by the trustee in an unlawful preference for which the trustee might be held liable.

2.4.2. *Convertibility provisions*

Description. A convertible debenture is one which gives the holder the right to exchange the debentures for other securities of the company, usually shares of common stock and usually without payment of further compensation. The convertible must contain provisions specifying:

⁴⁶The model indenture provision on this point from the American Bar Foundation (1971) states:

'The Company will file with the Trustee on or before..., and on or before each [insert month and day] thereafter so long as the Debentures shall remain Outstanding, a Certificate of Available Gas Supply. In the event that any such Certificate shall show that the date of exhaustion of available gas supply of the Company is a date earlier than..., the aggregate of the Sinking Fund installments due on the next succeeding Sinking Fund Date and each Sinking Fund Date thereafter up to and including the Sinking Fund Date immediately preceding a date (herein called the Margin Date) two years prior to said date of exhaustion of available gas supply shall be increased by an amount equal to the aggregate of the Sinking Fund instalments due on and after the Margin Date, each such Sinking Fund Instalment coming due between the date of such Certificate and the Margin Date being increased proportionately, as nearly as may be, so that each increased installment shall be multiple of \$1,000 and the Sinking Fund installments due on and after the Margin Date shall be eliminated and the schedule of Sinking Fund installments thus revised shall constitute the schedule of Sinking Fund installments under this Indenture until further revised as hereinafter provided.'

⁴⁷If specific bonds have been selected for purchase or redemption by the sinking fund, and all necessary steps have been taken except the actual surrender of the bonds, the funds in the hands of the trustee become specifically allocated to the selected bonds. In the event of subsequent default the holder is entitled to payment upon surrender of the bonds, regardless of the payoff to the other bondholders. If default occurs before all steps necessary for retirement of a specific bond have been concluded, all further action is typically suspended. Any preliminary steps taken are revoked, and the funds are retained by the trustee until the default is cured or the trustee receives judicial direction as to the disposition of the funds.

- (1) The type of security issuable upon conversion. This is usually common stock of the company, but occasionally it has been stock of a parent or affiliated corporation.
- (2) The duration of the conversion period. This may start at the time of issuance or after a specified date, and run until maturity, redemption, or some specified earlier date. The New York Bond Exchange will not permit the designation 'convertible' on the issue unless the privilege extends for the life of the debenture. The exchange will permit the formal designation to be followed by '(convertible prior to ...)'.⁴⁸
- (3) The conversion price at which the stock can be acquired. The conversion price may be the same for the entire period or increase at stated intervals. The conversion price is normally payable only by surrender of a like principal amount of the debentures but occasionally the payment of cash in a fixed ratio to debentures is also required.
- (4) Additional Procedural Points. E.g., where must the issue be surrendered for conversion? Does the debenture holder receive accrued interest upon conversion? Will the firm issue fractional shares?
- (5) Antidilution Provisions. Provisions which protect the conversion privilege against certain actions by the stockholders such as stock splits, stock dividends, rights offerings, issuance of other convertible securities, mergers, and the distribution of assets.

Analysis. Jensen/Meckling (1976) and Mikkelson (1978) discuss the use of convertible debt as a way to control aspects of the bondholder-stockholder conflict of interest. With non-convertible debt outstanding, the stockholders have the incentive to take projects which raise the variability of the firm's cash flows. The stockholders can increase the value of the equity by adding a new project with a negative net present value if the firm's cash flow variability rises sufficiently. The inclusion of a convertibility provision in the debt reduces this incentive. The conversion privilege is like a call option written by the stockholders and attached to the debt contract. It reduces the stockholders' incentive to increase the variability of the firm's cash flows, because with a higher variance rate, the attached call option becomes more valuable. Therefore the stockholders' gain from increasing the variance rate is smaller with the convertible debt outstanding than with non-convertible debt.

However, not all debt contracts include a convertibility provision since it is costly to do so.⁴⁸ For example, the underinvestment problem is exacerbated with convertible debt outstanding.

⁴⁸If part of the incentive for issuing debt comes from the tax deductibility of interest payments, then the tax treatment of interest payments by the Internal Revenue Service can be important and is affected by whether the debt is convertible. Where the capitalization of a corporation is largely debt, the IRS under Section 385 of the Tax Code can contend that some of the 'loans' are in fact capital contributions, and will deny the deduction of 'interest' on the loans. While debt-equity ratios of as much as 700 to 1 have been allowed for tax purposes, the

Evidence. Mikkelson (1978) presents cross-sectional evidence that the probability of the inclusion of the conversion privilege is positively related to (1) the firm's debt/equity ratio, (2) the firm's level of discretionary investment expenditure, and (3) the time to maturity of the debt. Each of these relationships is consistent with the Costly Contracting Hypothesis, and the hypothesis that the benefits of convertible debt are related to a reduction in the bondholder-stockholder conflict.

2.4.3. *Callability provisions*

Description. The firm's right to redeem the debentures before maturity at a stated price is typically included in the indenture agreement. Without the inclusion of the callability provision in the indenture agreement, a debenture holder cannot be compelled to accept payment of his debenture prior to its stated maturity date. In the usual case, the call price is not constant over the life of the bonds. The redemption price in a callable bond normally is initially set equal to the public offering price plus one year's interest on the bond. The schedule of call prices then typically scales the call premium to zero by a date one year prior to the maturity of the bonds, although it is sometimes as early as two to five years prior to maturity.

Analysis. We have suggested that if agency costs of equity are zero and recapitalization of the firm is costless, the firm will accept all projects with positive net present values and thus the stockholder-bondholder conflict of interest will be solved. One cost of buying out bondholders in a recapitalization results from the additional premium the bondholders demand for the firm to repurchase the bonds. Since the firm cannot vote bonds which it repurchases, a bilateral monopoly results from the attempt to repurchase

Treasury is inclined to look askance at 'loans' by stockholders in proportion to their stockholdings to a corporation with a high debt-equity ratio.

Whether stockholder advances to a corporation are loans or equity is a question of fact under the Tax Code. The taxpayer has the burden of proof as to this fact. The Treasury has issued guidelines for determining whether a corporate obligation is equity or debt. The major factors are: (1) the ratio of debt to equity of the corporation; (2) the relationship between holdings of stock and holdings of debt; (3) whether the debt is convertible into the stock of the corporation; (4) whether there is a subordination to or preference over any indebtedness of the corporation; and (5) whether there is a written, unconditional promise to pay on demand, or on a specified date a sum of money in return for adequate compensation, and to pay a fixed rate of interest.

If the IRS determines that the 'debt' is really equity there are a number of tax consequences. (1) The 'interest' deduction to the corporation is disallowed. (2) All payments of 'interest' and 'principal' are treated as dividend income to the shareholder/lender. (3) The shareholder/lender is denied a bad debt deduction if the corporation is unable to pay the principal.

The guidelines point out a potential cost in making all debt convertible. Even if the agency costs of debt are reduced to zero when stockholders and bondholders are the same, there can be an associated increase in taxes paid by the firm and its claimholders. It should be kept in mind, however, that factors other than taxes are necessary to explain why, prior to the corporate income tax, firms typically did not issue proportional claims, and not all debt was convertible.

the outstanding bonds. With a bilateral monopoly it is indeterminate how the gains will be divided between stockholders and bondholders. As Bodie/Taggart (1978) and Wier (1978) argue, a call provision places an upper limit on the gains which the bondholders can obtain. Wier notes further that if side payments can be negotiated costlessly, then the bondholder monopoly is unimportant from the standpoint of the value of the firm; the callability provision merely redistributes the property rights to the monopoly from bondholders to stockholders. Implicit in the argument that the call provision affects the total value of the firm is the notion that the bilateral monopoly implies real resource expenditures on negotiation.

It should also be noted that our argument cannot represent the only reason for callable bonds: after all, government bonds are often callable but there is no obvious investment incentive problem which such a provision addresses.⁴⁹

2.5. Covenants specifying bonding activities by the firm

Potential bondholders estimate the costs associated with monitoring the firm to assure that the bond covenants have not been violated, and the estimate is reflected in the price when the bonds are sold. Since the value of the firm at the time the bonds are issued is influenced by anticipated monitoring costs, it is in the interests of the firm's owners to include contractual provisions which lower the costs of monitoring. For example, observed provisions often include the requirement that the firm supply audited annual financial statements to the bondholders. Jensen/Meckling call these expenditures by the firm bonding costs.

2.5.1. Required reports

Description. Indenture agreements discussed in *Commentaries* normally commit the company to supply financial and other information for as long as the debt is outstanding. Typically, the firm agrees to supply the following types of information: (1) all financial statements, reports, and proxy statements which the firm already sends to its shareholders; (2) reports and statements filed with government agencies such as the SEC or Public Utility Commissions; (3) quarterly financial statements certified by a financial officer of the firm and (4) financial statements for the fiscal year audited by an independent public accountant.

Analysis. Our analysis suggests that bondholders find financial statements to be useful in ascertaining whether the provisions of the contract have been (or are about to be) violated. If the firm can produce this information at a

⁴⁹In addition, since virtually all debt is callable, there is little cross-sectional variation in its use. For a discussion of the empirical testability of arguments for callable debt, see Wier (1978).

lower cost than the bondholders (perhaps because much of the information is already being collected for internal decision making purposes), it pays the firm's stockholders to contract to provide this information to the bondholders. The market value of the firm increases by the reduction in agency costs.⁵⁰

Jensen/Meckling (1976) and Watts (1977) point out that firms have the incentive to provide financial statements which have been audited by an external accounting firm if the increase in the market value of the bonds is greater than the present value of the auditing fees, net of any nominal benefits which accrue in internal monitoring. If bonding activities which are related to the bondholder-stockholder conflict involve incremental costs, then since the conflict increases with the debt in the firm's capital structure, the use of externally audited financial statements should be positively related to the firm's debt/equity ratio. Auditing expenditures should be associated with the extent to which covenants are specified in terms of accounting numbers from financial statements.^{51, 52}

2.5.2. *Specification of accounting techniques*

Description. As indicated, covenants restricting dividend, financing, and production/investment policy are frequently specified in terms of income or balance sheet numbers.⁵³ For public debt issues, other than stating that they should be consistent with generally accepted accounting principles (GAAP), covenants frequently do not specify how the accounting numbers will be computed.

Analysis. Restrictions on the shareholders' behavior can be relaxed by manipulating the accounting numbers which define the constraints.⁵⁴ For example, the impact of a change in accounting techniques on dividend and investment policy can be seen by referring to eq. (1) defining the inventory of funds for payment of dividends. The change in allowed dividend payments in quarter τ resulting from a change in earnings in quarter τ is proportional to k (i.e., $\partial D_t^*/\partial E_t = k$). If accounting earnings are overstated, then required current investment is increased by $(1-k)$ times the change in reported earnings. After the bonds have been sold, shareholders have an incentive to use whichever method of calculation inflates stated earnings. However, this

⁵⁰See Jensen/Meckling (1976, p. 338) and Watts (1977).

⁵¹For a further discussion of the incentives to employ external auditors, see Watts (1977).

⁵²Furthermore, this analysis leads Leftwich/Watts/Zimmerman (1979) to predict that voluntary public disclosure of financial statements prior to required provision by the exchanges or regulation should be associated with the level of debt in the firm's capital structure.

⁵³See Holthausen (1979) and Leftwich (1979) for more comprehensive analyses of the use of accounting definitions in bond covenants.

⁵⁴One case where accounting manipulations may have been made to prevent the firm from violating its debt covenants is that of Pan American World Airways. See Foster (1978, p. 354).

argument overstates the incentive to manipulate accounting earnings if current earnings can only be increased by reducing future earnings. To illustrate, since the total amount of depreciation on a machine is fixed, taking less depreciation now implies that future accounting earnings will be reduced. In this case the shareholders can only lower required current investment by increasing required future investment. The magnitude of the gain to the shareholders from manipulation of accounting numbers is on the order of the discount rate multiplied by k times the change in reported earnings and this is likely to be relatively small.

It is expensive to specify the accounting procedure by contract and, if the specified procedure differs from GAAP, it is expensive to prepare an additional set of accounting statements for the bondholders. Such detailed procedures can be a more costly mechanism for the bondholders to protect themselves against 'creative accounting' than by requiring external auditing and reflecting any risk of accounting manipulations in the price paid for the bonds.

Holthausen (1979) argues that the firm's decision to change depreciation methods could result in a change in reported earnings which relaxes contractual constraints and results in a transfer of wealth to stockholders. Furthermore, Leftwich (1979) argues that restricting stockholders to GAAP involves costs since over time, accounting principles change. Mandated changes in GAAP can cause the constraints on the stockholders' behavior to change and in some cases to be violated.⁵⁵ Leftwich's analysis predicts that certain changes in GAAP should be associated with wealth losses to the firm's claimholders. Moreover, the extent of the loss should be related to the extent to which the contracts are specified in terms of GAAP.

2.5.3. *Officers' certificate of compliance*

Description. *Commentaries* suggests that in addition to submitting the reports indicated above, the firm usually promises to provide an annual certificate as to whether there has been any default under the indenture. The Certificate of Compliance must be signed both by the president or vice-president, and by either the treasurer, assistant treasurer, controller or assistant controller of the company. The statement indicates that the signing officer has reviewed the activities of the company for the year, and that to the best of his knowledge the firm has fulfilled all of its obligations under the indenture. If there has been a default, the nature and status of the default must be specified. Some indentures also call for certificates or opinions as to compliance to be supplied by independent accountants. Normally it is provided that the accountants' statement certify that during the examination the accountants 'obtained no knowledge' of any default. The accountants are

⁵⁵Fogelson (1978) discusses several cases where this has occurred.

often expressly relieved of all liability for failure to obtain knowledge of a default.

Analysis. The Costly Contracting Hypothesis suggests that the certificate of compliance is a way of reducing the monitoring costs of the bondholders. It is less expensive to have officers of the firm or the firm's accountants, who already will be knowledgeable of any defaults, contract to call such defaults to the attention of the bondholders than to let bondholders themselves ascertain if a default has occurred.

2.5.4. *The required purchase of insurance*

Description. Indenture agreements frequently include provisions requiring the firm to purchase insurance. The sample covenants in *Commentaries* specify that the firm will purchase insurance 'to substantially the same extent as its competitors'. The stockholders sometimes retain the right to self-insure if the plan is certified by an actuary. Typically, the indenture requires the firm to maintain liability insurance.

Analysis. In a world with perfect markets, there is no corporate demand for insurance; the corporate form effectively hedges insurable risk.⁵⁶ Our analysis suggests that the corporate purchase of insurance is a bonding activity engaged in by firms to reduce agency costs between bondholders and stockholders (as well as between the managers and the owners of a corporation). If insurance firms have a comparative advantage in monitoring aspects of the firm's activities, then a firm which purchases insurance will engage in a different set of activities from a firm which does not.

For example, a frequently purchased line of corporate insurance is boiler insurance. Insurance companies hire and train specialized inspectors to monitor the operation and maintenance of boilers, and the loss control program which is provided by the insurance company constrains the actions of the stockholders and managers of the firm. A covenant requiring the purchase of insurance gives stockholders the incentive to engage in the optimal amount of loss control projects. If the purchase of a sprinkler system were a positive net present value project it could still be rejected by stockholders of a levered firm because it reduces the variance rate of the firm's cash flows and thereby increases the value of the debt. But if the firm is contractually required to purchase insurance and if the insurance industry is competitive, the firm has the incentive to take any loss control project where the present value of the premium reductions is greater than the cost of the project. With the purchase of insurance the corporation's cash flow variability is unaffected by the purchase of loss control projects.

⁵⁶See Mayers/Smith (1978).

3. The enforcement of bond covenants

The covenants we have discussed do not completely control the conflict between bondholders and stockholders; they do not go nearly so far as they could in restricting the firm's actions. The covenants could require that the firm secure permission of the bondholders for each action it takes, or that the firm 'accept all profitable projects, and only those projects'. However, as Jensen/Meckling (1976, p. 338) and Myers (1977, p. 158) argue, if such covenants are sufficiently expensive to enforce, it will not be in the interests of the firm's owners to offer them.

To specify types of enforcement costs, we must examine the institutional framework within which covenant enforcement takes place for further insight into why certain kinds of covenants are observed – and others not. Our analysis takes the institutional arrangements as given. A deeper issue relates to the endogeneity of the institutions themselves. To the extent that the existing legal institutions represent an efficient solution to the problem of financial contracting, enforcement costs are lowered. But regardless of whether or not existing institutions imply 'minimum' costs, the types of contracts we observe depend on the level of these institutionally-related costs.

3.1. *The legal liability of bondholders*

Description. When bondholders exercise a significant degree of 'control' over the firm, they become legally liable to both the firm (i.e., the shareholders) and to third parties for losses incurred as a result of certain of their actions.⁵⁷ Although acts such as the seizure of collateral do not, in general, subject the creditor to liability,⁵⁸ creditor liability still occurs under a variety of conditions. For example, it can arise when a creditor who controls the firm is responsible for mismanagement. One of the leading cases is *Taylor versus Standard Gas Company*,⁵⁹ in which the court held the firm's creditor responsible for abuses which resulted from the exercise of control.

Creditors whose debt contracts contain restrictions which cause the firm to breach its contract with third parties, such as suppliers, employees, and other creditors, can also be held liable. One notable case in which a covenant

⁵⁷Much of the discussion of the liability issue is based on the survey article of Douglas-Hamilton (1975). The liability of bondholders depends critically on the definition of 'control'. In the case of liability for securities law violations, 'a creditor would be considered in control of a corporate debtor even if only indirectly possessed the power to direct the management or the policies of the debtor'. See Douglas-Hamilton (pp. 346–347).

That the courts frown upon bondholder control is not a new notion. Dewing (1953, pp. 188–189) indicates that the 'exclusion of bondholders from all voice in the management of the corporation has been sanctioned by centuries of legal authority' and is a 'time honored legal theory'.

⁵⁸Douglas-Hamilton (p. 364).

⁵⁹306 U.S. 307 (1939). See Douglas-Hamilton (p. 348).

violated the rights of third parties is that of *Kelly versus Central Hanover Bank and Trust Company*.⁶⁰ There, the bondholders of the debtor corporation brought suit against another class of claimants, namely the creditor banks of the debtor. The bondholders charged that the banks, in obtaining a covenant pledging stock as security for their loans, violated the terms of the indenture agreement between the bondholders and the debtor. According to Douglas-Hamilton (1975, p. 364):

‘It appears that the case against the banks was later settled on terms which included a payment of \$3,435,008 by the banks to the bondholders and the withdrawal by the banks of claims aggregating \$42,887,500 in the debtor corporation’s bankruptcy proceedings.’

Creditors can also incur liability for Federal Securities Law violations. For example, under Rule 10b-5 of Section 10 of the Securities Act of 1934, which deals with fraud, a creditor incurs liability for failing to disclose material information about the firm. Creditor liability even arises in cases where there has been inadequate ‘policing by a creditor of press releases of its troubled debtor to insure that they do not depict an inaccurate optimistic picture to the public’.⁶¹

Analysis. Covenants which have the effect of assigning legal liability to the bondholders represent a real cost to the firm’s owners if bondholders, or their agent, are more likely than the firm’s management to be held responsible for actions which result in losses and if the legal process which establishes liability is costly. In that case, giving bondholders control is a more costly way to run the firm simply because of the legal costs involved in the determination of bondholder liability. The firm’s owners are better off simply not issuing those types of debt which are likely to result in such costs being incurred. While we have no direct evidence on the costs of creditor liability, one comment from the legal literature which suggests that those costs are not trivial is the warning that ‘whenever a creditor contemplates taking a hand in the management of a financially troubled debtor, it should think of its deeper pockets and keep its hands there’.⁶²

3.2. *The role of the trust indenture and the trustee*

Description. Debt contracts discussed in *Commentaries* typically appoint an independent ‘trustee’ to represent the bondholders and act as their agent in covenant enforcement. This is done under a device known as a corporate trust indenture, which specifies the respective rights and obligations of the

⁶⁰85 F 2d 61 (2d Cir 1936)

⁶¹Douglas-Hamilton (p. 354).

⁶²Douglas-Hamilton (p. 364).

firm, the individual bondholders, and the trustee. Although the trustee is an agent of the bondholders, in practice he is actually compensated by the firm.⁶³

Analysis. If the firm's debt is not held by a single borrower, then a number of problems related to enforcement of the debt contract arise. For example, any individual's holdings of the firm's debt may be so small that no single bondholder has much incentive to expend resources in covenant enforcement. But it is not the case that individual bondholders necessarily expend 'too few' resources in covenant enforcement. If the number of bondholders is small, then there can actually be overinvestment in enforcement in the sense that there is either a duplication of effort, or that creditors expend resources which simply result in change in the distribution of the proceeds. Our analysis implies that the firm's owners offer a contract which appoints a trustee to help assure that the optimal amount of covenant enforcement will take place.

Having the firm pay the trustees directly solves the 'free-rider' problem which would be inherent in making individual bondholders pay the trustee for enforcing the covenants. However after the bonds have been sold, the stockholders have an incentive to bribe the trustee so that they can violate the debt covenants. There are several factors which prevent such bribery from taking place.

Bribing the trustee is expensive if the trustee's reputation has significant value in the marketplace. *Ex ante*, it is in the interests of the firm's owners to choose an 'honest' trustee – that is, one who is expensive to bribe. This is because the value of the firm at the time it issues the debt contract reflects the probability of covenant enforcement. To the extent that enforcement by an 'honest' trustee reduces the problems of adverse borrower behavior induced by risky debt, the value of the firm is higher. Our analysis therefore implies that those chosen as trustees stand to lose much if they are caught accepting bribes. In fact, the indenture trustee is 'generally a large banking institution',⁶⁴ which has significant revenues from activities unrelated to being a trustee and which also depend on the market's perception of its trustworthiness. Furthermore, the behavior of the trustee is restricted by both trust and contract law.⁶⁵

3.2.1. *The Trust Indenture Act of 1939*

Description. Publicly issued debt obligations must comply with the requirements of the Trust Indenture Act of 1939 (TIA).⁶⁶ Although the TIA does

⁶³For a further discussion of the trustee's compensation, see Kennedy (1961, p. 49).

⁶⁴Obrzut (1976, p. 131).

⁶⁵For a further discussion, see Kennedy, especially chapter 2.

⁶⁶There are minor exceptions. For example, issues of less than \$1 million are exempted. The TIA is enforced by the Securities and Exchange Commission. For the bonds to be sold, the terms of the indenture must be 'qualified' by the SEC.

not explicitly regulate the restrictive covenants which the bond contract can include, the TIA does impose certain standards of conduct on the trustee. The trustee must meet certain minimum capital requirements. The trustee is not permitted to have a serious conflict of interest; with some minor exceptions, he may not act as the agent for two different classes of bondholders of the same firm, and he may not himself be a creditor in the firm for whose debt contract he acts as trustee.⁶⁷

Analysis. In spite of these restrictions on the behavior of the trustee, it can still be very costly to write a contract where the bondholders are represented by such an agent. The trustee will still not act entirely in the bondholders' interest. This is particularly true because the extent to which the trustee can be held negligent is limited: while the trustee must act in good faith, his responsibilities often go no further unless there is a default. Under the TIA, when a default has occurred the trustee is only required to 'use the same degree of care and skill... as a prudent man would exercise' in enforcing the covenants. Furthermore it is not clear whether, prior to the TIA, the legal standards for either pre- or post-default conduct of trustees were significantly different.⁶⁸

3.2.2. *Public versus private placements*

Description. Section 4(2) of the Securities Act of 1933 provides that a sale of securities not involving any public offering is exempt from registration. Such exempt issues are referred to as private placements or direct placements. Private placements are not typically subject to the TIA. They represent an alternative to publicly placed debt.

Analysis. Since the enforcement of tightly restrictive covenants through a trustee is difficult, the benefit from private (rather than public) placement of the firm's debt issues can be substantial. Our analysis suggests that private placements will contain more detailed restrictions on the firm's behavior than do public issues.⁶⁹ In addition, we would expect that the riskier the debt, the more likely that it will be privately placed. Because of the costs associated with the enforcement of trust indentures, the covenants in debt issues are not likely to eliminate the problems induced by the presence of risky debt.

⁶⁷Kennedy (p. 35) claims that the standards of conduct contained in the TIA 'had been accepted and followed by the more responsible trust companies for a long time prior to the enactment of the legislation, so that no abrupt or sudden change was effected'. A major proponent of the legislation which resulted in the TIA was the Securities and Exchange Commission [Obrzut (1976, p. 133)]

⁶⁸For a further discussion, see Johnson (1970).

⁶⁹That private issues contain more restrictive covenants than public issues is consistent with the observations of the authors of *Commentaries* (p. 11 and p. 14). Note that private issues may also have trustees, even though the number of claimholders is typically small.

Evidence. Consistent with the hypothesis that privately placed debt contracts contain more extensive provisions than public, Leftwich (1979) presents evidence that variations from generally accepted accounting procedures occur more frequently in private than public debt issues. The adjustments to GAAP are systematic; they generally eliminate non-cash gains. However they do not restrict non-cash losses. For example, restatement of asset values which result in gains are typically eliminated from computed earnings while those resulting in losses are not.

Cohan (1967, p. 1) finds evidence of a shift to private placements during the 1930s: 'In the thirty-four years from 1900 to 1934, about 3 percent of all corporate debt cash offerings, or approximately \$1 billion were directly (privately) placed. However, in the ensuing thirty-one years, from 1935 to 1965, 46 percent, or \$85 billion, were directly placed.' While our analysis does predict such a shift to private placements after the TIA, this shift is also consistent with Benston's (1969) suggestion that the inception of the SEC in 1934 increased the cost of public versus private issues.

3.3. *Default remedies*

The debt contract typically gives the firm a strong incentive to live up to the restrictive covenants: any breach of the covenants is considered an act of default. Not only is the firm normally required to report any such breach, but the lender is given the right to engage in certain actions (e.g., seizure of collateral, acceleration of the maturity of the debt) to protect his interest.

3.3.1. *Renegotiation*

Description. Since actions such as the seizure of collateral consume real resources, the debt contract is often renegotiated in order to eliminate the default. In public debt issues the contract can be changed by the use of a 'supplemental indenture'. The supplement must be approved by the bondholders, and must meet the requirements of the TIA.

Changes in the specific covenants cannot usually be made without the consent of the holders of two-thirds in principal amount of the outstanding debt⁷⁰ (the firm itself is not allowed to vote any debt it holds). Moreover, the consent of 100 percent of the debtholders is required in order to change the maturity date or principal amount of the bonds. In private placements involving few lenders, renegotiation is typically easier.⁷¹

⁷⁰See *Commentaries* (p. 307) and Section 902, American Bar Foundation Model Debenture Indenture Provisions - All Registered Issues.

⁷¹According to Zinbarg (1975). 'My own institution's experience [Prudential Insurance Co. of Am] may serve as an illustration. In any given year, we will, on average, receive one modification request per loan on the books. In no more than five per cent of these cases will we refuse the request or even require any quid pro quo, because the vast majority of corporate requests are perfectly reasonable and do not increase our risk materially.'

Analysis. The seemingly lower renegotiating costs of privately placed debt issues further re-inforce our earlier prediction that such private placements will contain tighter restrictions on the firm's behavior than will public issues.

3.3.2. *Bankruptcy*

Description. Should renegotiation fail, a default also gives the lender the right to put the firm into legal bankruptcy proceedings. Several features of the bankruptcy process bear on the enforcement of debt contracts. For example, since the bankruptcy process gives the firm temporary protection from acts of foreclosure and lien enforcement, some enforcement mechanisms are no longer available to the lender.

Analysis. Our theory suggests that it is more efficient to have some ambiguities in the initial debt contract, and to let them be resolved in bankruptcy should default ever occur. Since it is the firm's owners who bear the total costs associated with enforcing the debt contract, it is in their interests to find the most efficient balance between expenditures on drafting the debt contract and expected legal expenditures in bankruptcy. In a world where contracting is costly, that balance will imply less than complete specification of the payoff to be received by claimholders in every possible future state of the world.

As Warner (1977) discusses, bankruptcy courts recognize the priorities specified in the firm's debt agreements in only a limited sense. There are many cases where 'junior' claimants are compensated before claimants 'senior' to them are paid in full. Since 'priorities' are not always enforced, it will not always pay the firm to indicate the priority of a given debt issue with much specificity (e.g., creditor A is forty-seventh in line).

4. **Conclusions**

4.1. *The role of bond covenants*

We have examined the specific provisions which are included in corporate debt contracts. Since covenants are a persistent phenomena, we can therefore assume that these provisions are efficient from the standpoint of the firm's owners, and thus we can draw inferences about the role of these contractual forms in the firm's capital structure.

Observed debt covenants reduce the costs associated with the conflict of interest between bondholders and stockholders; the ingenuity with which debt contracts are written indicates the strong economic incentives for the firm's owners to lower the agency costs which can result from having risky debt in the firm's capital structure.

The existence of standardized debt contracts such as those found in

Commentaries suggests that the out-of-pocket costs of drafting observed bond contracts are small indeed. However, the direct and opportunity costs of complying with the contractual restrictions appear to be substantial. We have presented no evidence on the precise dollar magnitudes, and we emphasize that a particular covenant included in a given debt contract will not impose opportunity costs with probability one. But our analysis indicates that observed bond covenants involve expected costs which are large enough to help account for the variation in debt contracts across firms. This is consistent with the Costly Contracting Hypothesis. On the other hand, it is inconsistent with the Irrelevance Hypothesis, which predicts that total resource expenditures on control of the bondholder–stockholder conflict will be negligible.

Our analysis also sheds some light on the relative costs of the alternative types of restrictions which can be written into the debt contract. We conclude that production/investment policy is very expensive to monitor. Stockholder use (or misuse) of production/investment policy frequently involves not some explicit act, but the failure to take a certain action (e.g., failure to accept a positive net present value project). It is expensive even to ascertain when the firm's production/investment policy is not optimal, since such a determination depends on magnitudes which are difficult to observe. The high monitoring costs which would be associated with restrictive production/investment covenants, including the potential legal costs associated with bondholder control, dictate that few production/investment decisions will be contractually proscribed. For the firm's owners to go very far in directly restricting the firm's production/investment policy would be inefficient.

On the other hand, we conclude that dividend policy and financing policy involve lower monitoring costs. Stockholder use of these policies to 'hurt' bondholders involves acts (e.g., the sale of a large bond issue) which are readily observable. Because they are cheaper to monitor, it is efficient to restrict production/investment policy by writing dividend and financing policy covenants in a way which helps assure that stockholders will act to maximize the value of the firm.

4.2. Implications for capital structure

With more fixed claims in the capital structure, the benefits to the stockholders from asset substitution, claim dilution, underinvestment, and dividend payout increase; with higher benefits, the stockholders will expend more real resources 'getting around' any particular set of contractual constraints. This, in turn, will increase the benefits of increased tightness of the covenants. Accordingly, the costs associated with the bondholder–stockholder conflict rise with the firm's debt/equity ratio. Simply limiting the

debt in the capital structure is an efficient mechanism for controlling this conflict. Because of this, the costs associated with writing and enforcing covenants influence the level of debt the firm chooses.

Since observed debt covenants involve real costs, there must be some benefit in having debt in the firm's capital structure; otherwise, the bondholder-stockholder conflict can be costlessly eliminated by not issuing debt. Hence our evidence indicates not only that there is an optimal form of the debt contract, but an optimal *amount* of debt as well. The benefits from issuing risky debt are not well understood, and even though the costs we have discussed in this paper provide a lower bound on their magnitude, our analysis has not permitted us to distinguish between alternative explanations of the benefits: (1) information asymmetries and signalling, (2) taxes, (3) agency costs of equity financing, (4) differential transactions and flotation costs, and (5) unbundling of riskbearing and capital ownership.

4.3. *Some possible extensions*

While our analysis of debt covenants is a useful start at explaining certain aspects of the firm's capital structure, there are a number of issues which have not been explored here which, we believe, merit further attention. We have attempted to indicate the interrelationship between covenants restricting dividend, financing, and production/investment policy. However, we have not developed a theory which is capable of explaining how, for a given debt issue, the total 'package' of covenants is determined. Further work on the substitutability or complementarity of the specific contractual provisions is necessary before it is possible to predict, for any set of firm-specific characteristics, the form which the debt contract will take.

Second, we emphasize that bond covenants are but one way in which the behavior of the stockholders is constrained. For example, both the legal system and the possibility of takeovers are factors which make it more expensive for stockholders to engage in actions aimed at maximizing the value of their own claim but not the total value of the firm. The relative importance of these factors, and how they affect the firm's choice of debt covenants, is not yet well understood.

Finally, it is important to remember that in focusing on the bondholder-stockholder conflict, we have ignored other conflicts, such as that between managers and stockholders, which also exist. To the extent that the contracts comprising the firm are interdependent and simultaneously determined, the bondholder-stockholder conflict should not be viewed in isolation. The impact of the bondholder-stockholder conflict on the firm's total contracting costs cannot be fully understood until the nature of these contractual interdependencies is explored.

Appendix

In this appendix, we consider in more detail the results presented in section 1. First, we discuss the valuation of the debt of a levered firm when the relevant variables in the valuation equations can be specified parametrically over the life of the bonds. We then expand the analysis to the case where stockholders can change these variables after they obtain the proceeds from the sale of the debt, and where both the stockholders and bondholders are aware of this possibility when the bonds are originally issued.

A.1. Option pricing valuation of the firm's financial claims

The valuation of the equity and debt of a levered firm is examined by Black/Scholes (1973) and Merton (1974). Where the bonds are single-payment contracts and the market is efficient and competitive, without transactions costs, information costs, other agency costs, or taxes, the analysis is straightforward. Consider a bond contract which promises to repay a lump sum, X , covering both principal and interest at a specified date in the future, t^* . When the bond issue is sold, the proceeds from the sale equal the current value of the bondholders' claim, B , on the firm's assets. Assume that the firm's financial claims consist of this bond issue and common stock. Thus, the current value of the stock, S , is the difference between the current value of the firm's assets, V , and the value of the bonds, B ,

$$S \equiv V - B. \quad (\text{A.1})$$

Given this contract, the optimal strategy for the firm's shareholders at the maturity date of the bonds can be specified: if the value of the firm's assets at the maturity date, V^* , is greater than the face value of the bonds, X , then repay the bonds; the stockholders equity at that date, S^* will be the difference between the value of the firm's assets and the face value of the bonds, $V^* - X$. On the other hand, if at the maturity date of the bonds the value of the firm's assets is less than the face value of the bonds, then default on the bonds; the bondholders do not receive the face value of the bonds, they receive only the firm's assets, V^* . Given limited liability, the shareholders' equity is zero. Thus, at t^* the value of the stock, S^* , is

$$S^* = \max[0, V^* - X], \quad (\text{A.2})$$

and the value of the bonds is

$$B^* = \min[V^*, X]. \quad (\text{A.3})$$

This bond issue is equivalent to the sale of the firm's assets to the bondholders for a package containing: (1) the proceeds from the sale of the bonds, B , (2) a claim which allows the stockholders to receive the dividends paid by the firm over the life of the bonds, and (3) a European call option⁷² to repurchase the assets at the maturity date of the loan T time periods later ($T = t^* - t$), with an exercise price equal to the face value of the bonds, X . Those variables which affect the value of call options are also important in valuing the financial claims of firms.

To derive an explicit solution for the market value of the bonds given the other variables, make the following assumptions:

- (1) There are homogeneous expectations about the dynamic behavior of the value of the firm's assets. The distribution at the end of any finite time interval is lognormal. The variance rate, σ^2 , is constant.
- (2) The dynamic behavior of the value of the assets is independent of the face value of the bonds, X .
- (3) There are no transactions costs associated with default.
- (4) The firm pays a continuous flow of dividend payments to the shareholders. The dividend payment, per unit time D , is a constant fraction, δ , of the market value of the assets: $\delta = D/V$.
- (5) Capital markets are perfect. There are no transactions costs or taxes. All participants have free access to all available information. Participants are price takers.
- (6) There is a known constant riskless rate of interest, r .⁷³

Under these assumptions, Merton (1974) has shown that the value of the bonds, B , can be written as

$$B = Ve^{-\delta T} N \left\{ \frac{-\ln(V/X) - (r - \delta + \sigma^2/2)T}{\sigma\sqrt{T}} \right\} + Xe^{-rT} N \left\{ \frac{\ln(V/X) + (r - \delta - \sigma^2/2)T}{\sigma\sqrt{T}} \right\}, \quad (\text{A.4})$$

⁷²A European call option is a contract which gives the owner the right to purchase a specified asset at a specified price, called the exercise price, on a specified date, called the maturity date. Since the option is only exercised if it is in the best interest of the owner, it will be exercised only if the value of the asset is above the exercise price at the maturity date; otherwise it will expire worthless.

⁷³Merton (1973) has modified the Black/Scholes contingent claims analysis to account for time series variability in interest rates. His solution retains the basic form of this analysis. Since the effects of the variability of the riskless rate and term structure are not of primary concern here, this simpler assumption will be maintained.

where $N\{\cdot\}$ is the cumulative standard normal distribution function. In general form,

$$B = B(V, X, T, \delta, \sigma^2, r), \quad (\text{A.5})$$

where

$$\frac{\partial B}{\partial V}, \frac{\partial B}{\partial X} > 0 \quad \text{and} \quad \frac{\partial B}{\partial T}, \frac{\partial B}{\partial \delta}, \frac{\partial B}{\partial \sigma^2}, \frac{\partial B}{\partial r} < 0.$$

A.2. *The nature of the covenants to be included in the debt contract*

As we discussed in section 1, in pricing the bonds the bondholders must ascertain the values of the variables in eq. (A.5). These variables can be changed after the bonds are issued; the bondholders make assessments of likely stockholder actions, given whatever restrictions the debt contract places on the stockholders. The particular covenants written are those which maximize the wealth of the firm's current owners. This is the set of covenants which maximizes the with-dividend value of the firm when the bonds are issued.

For explicit analysis of the incentives faced by the shareholders and bondholders in drafting the debt contract, the analysis of the valuation of claims must be expanded.⁷⁴ The firm's objective is assumed to be the maximization of current equity, S , and the current dividend, D ,

$$W \equiv S + D. \quad (\text{A.6})$$

For an all equity firm which has decided to sell bonds, the value of the stock, S , can be expressed as the total ex-dividend value of the firm, V , minus the value of the claim sold to the new bondholders, B ,

$$S \equiv V - B. \quad (\text{A.7})$$

The value of the claim sold to the new bondholders is a function of the projects chosen, and the terms of the contract. More specifically, let the firm choose a vector of activities, α , and a vector of provisions in its financial contracts, f (e.g., f includes the face value of the debt, X , and the time to maturity of the bonds, T , as well as covenants such as restrictions on dividend payments). In general, the value of the firm's assets, the variance rate, and the dividend payments area function of the activities and contractual provisions chosen. Thus the value to the stockholders of the claim sold to the bondholders can be expressed as

$$B = B(\alpha, f). \quad (\text{A.8})$$

⁷⁴The following analysis was suggested by John Long.

The cash flow identity that inflows equal outflows can be used to re-express the dividend payment, D , as the sum of the internally generated cash flow before interest expense, ϕ , plus the net proceeds from the sale of the new bonds, B , minus the new investment expenditures, I ,

$$D \equiv \phi + B - I. \quad (\text{A.9})$$

The proceeds from the sale of the new bonds will depend on the financial covenants, f , chosen. Let $\alpha(f)$ represent the activity that, given the choice of financial contract, f , maximizes the with-dividend value of the shareholder's equity. The bondholders will assume that if the contractual provisions are f , then the stockholders will act in their own self-interest and choose the vector of activities, $\alpha(f)$. Thus, the proceeds from the sale of the new bonds will be

$$B = B(\alpha(f), f). \quad (\text{A.10})$$

Substituting (A.7), (A.8), (A.9) and (A.10) into (A.6) allows us to re-express shareholder wealth as

$$W = V(\alpha, f) - B(\alpha, f) + B(\alpha(f), f) + \phi(\alpha, f) - I(\alpha, f). \quad (\text{A.11})$$

Thus, for a given financial structure, f , the optimal activity choice, α , to maximize shareholder wealth is

$$W(\alpha(f), f) = V(\alpha(f), f) + \phi(\alpha(f), f) - I(\alpha(f), f). \quad (\text{A.12})$$

From (A.12) it is clear that the optimal financial structure, f^* , will be that structure for which the with-dividend value of the firm is maximized subject to the available set of financial structures; i.e.,

$$\begin{aligned} & V[\alpha(f^*), f^*] + \phi[\alpha(f^*), f^*] - I[\alpha(f^*), f^*] \\ & \geq V[\alpha(f), f] + \phi[\alpha(f), f] - I[\alpha(f), f], \end{aligned}$$

for all feasible f .

This can be illustrated graphically. Let (α^{**}, f^{**}) be the point where the with-dividend value of the firm is maximized; i.e., where

$$\begin{aligned} & V(\alpha^{**}, f^{**}) + \phi(\alpha^{**}, f^{**}) - I(\alpha^{**}, f^{**}) \\ & \geq V(\alpha, f) + \phi(\alpha, f) - I(\alpha, f), \end{aligned}$$

for all choices of financial structure and activities, assuming that the magnitudes could be independently set. We call this point the 'idealized'

capital structure/activity choice for the firm. In fig. 1 the with-dividend value of the firm is represented in (α, f) space as level sets. The set of optimal activity choices as a function of financial structure, $\alpha(f)$, is also represented. The agency costs described by Jensen/Meckling (1976) are $[V(\alpha^{**}, f^{**}) + \phi(\alpha^{**}, f^{**}) - I(\alpha^{**}, f^{**})] - [V(\alpha(f^*), f^*) + \phi(\alpha(f^*), f^*) - I(\alpha(f^*), f^*)]$, i.e., the difference between the with-dividend value of the firm given the idealized capital structure and the idealized activity choice minus the value of the firm given the optimum (feasible) choice of activities and capital structure.

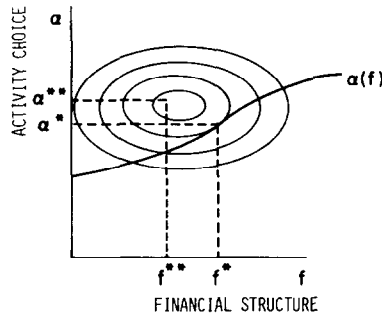


Fig. 1. Determination of the optimal financial structure, f^* , and activity choice, α^* . The collection of level sets represent different with-dividend market values of the firm, assuming the activity choice, α , and financial structure, f , can be set independently. The point (α^{**}, f^{**}) is the maximum with-dividend firm market value. The function $\alpha(f)$ represents the choice of activity which maximizes shareholder wealth for a given financial structure. Agency costs are $\{[V(\alpha^{**}, f^{**}) + \phi(\alpha^{**}, f^{**}) - I(\alpha^{**}, f^{**})] - [V(\alpha(f^*), f^*) + \phi(\alpha(f^*), f^*) - I(\alpha(f^*), f^*)]\}$.

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