Are Bond Covenants Priced?

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Abstract

In this paper we ask the empirical question are bond covenants priced? Consistent with the Costly Contracting Hypothesis (CCH) developed by Smith and Warner (1979), we find that they are. We document a negative relation between the promised yield on corporate debt issues and the presence of covenants. We also find that loans made to high-growth firms are more likely to include restrictive covenants than loans made to low-growth firms. We show that the inclusion of a covenant varies systematically with macroeconomic factors as well as with supply-side factors, especially the identity of the lending institution. Finally, we show that consistent with the CCH, firms that elect to issue private rather than public debt are smaller, have greater growth opportunities, less long term debt, fewer tangible assets, and include more covenants in their debt agreements. An important byproduct of our analysis is to demonstrate empirically that the decision to include a covenant and the corresponding promised yield are determined simultaneously. Consequently, statistical models that ignore this simultaneity in analyzing the effects of covenants, like single-equation probit models, are misspecified and generate unreliable statistics.

Many companies have increased their financial disclosure recently, responding to shareholders' cries for greater details about their operations. But most corporations still refuse to lay open a set of financial statistics that are central to their ability to survive. These are financial covenants, or restrictions a company has set with lenders in exchange for loans.[1]

1. Introduction

In this paper we examine the empirical relation between bond covenants and the firm's cost of debt capital. As alluded to above, this critical relation is not known nor generally appreciated by investors. The primary goal of this paper is to identify the critical parameters that define this relation.

Based on the theoretical work of Jensen and Meckling (1976), Smith and Warner (1979) argue that there is a tradeoff between promised yield and the inclusion of restrictive covenants: the greater the restrictive covenants, the less likely the firm's management will be able to expropriate the bondholders' wealth, and hence, the lower the required rate of return. They term this relation the Costly Contracting Hypothesis (CCH).

Based on a large sample of private debt issues and using a statistical model that captures the simultaneity between promised yields and the inclusion of covenant restrictions, we test a number of the predictions generated by the CCH. Specifically, we examine the relation between covenant inclusion and borrower characteristics, lender characteristics, macroeconomic factors and other contract features. We also test the prediction of the CCH that private placements will contain more detailed and tighter covenant restrictions as compared to public issues. Building on the work of Myers (1977), the CCH also predicts that covenant inclusion will be positively related to the firm's existing level of debt, the existence of so-called growth opportunities and the maturity of the issue. To be clear, however, our major objective is to test the prediction of the CCH that the inclusion of covenants in bond agreements reduces the cost of debt capital.

We perform our empirical tests on a large sample of private loans (14,112 loans made to 3,064 unique firms) during the period 1990-2001. It is important that we focus

[1] Gretchen Morganson, "Why the Secrecy About Financial Covenants?" NY Times, October 12, 2003

our attention on the private debt market, since most would agree that negotiating and especially renegotiating covenant restrictions is virtually impossible for a public bond issue. This is not to say that re-negotiation is costless for the parties to private bond issues. Indeed, there is empirical evidence that even very solvent firms take actions so as to avoid the costs in time and effort of renegotiating covenant constraints.[2] Thus, market forces will draw firms issuing risky debt naturally to private placements. Our empirical results bear out this prediction. When compared to public debt issuers, the firms in our private debt sample are smaller, have greater growth opportunities, less long term debt, fewer tangible assets, and include more covenants in their debt agreements.[3]

Our main contribution to the capital structure literature is to demonstrate empirically, that bond covenants are priced. We find a negative relation between the inclusion of a bond covenant and the promised yield on corporate debt. Consistent with the prediction of Myers (1977), we also find that high-growth firms are more likely to issue loans with dividend restrictions, security requirements and financial constraints than less growth-oriented firms. Myers argues that growth opportunities are similar to real options and that levered firms would allow these options to expire if the firm's bondholders would realize the bulk of the gains. Thus, firms will reduce the adverse effects of this so-called "under-investment" problem by issuing little or no debt, issuing only short-term debt or including covenants in their indenture agreements.

We document a positive relation between the inclusion of covenants and the maturity of the loan, reinforcing the notion that covenants act as an early warning device that allow lenders in effect to shorten the maturity of the loan. We also document a positive relation between the inclusion of covenants and the prevailing credit spread (the difference in the yields on BAA and AAA corporate bonds). This finding is consistent with the CCH. The greater the credit spread, the greater the general risk in the economy and hence the greater the probability that any firm will find itself in financial distress in the future. Similarly, we find that loans made during stock market depressions are more likely to contain restrictive covenants. During times of high market risk, issuers of risky

[2] Dichev and Skinner (2003). These authors argue that covenants act as trip-wires for lenders – something like an early warning system. Of course, if the renegotiations are not successful, the lender always has the option of forcing the firm into bankruptcy, which is a very costly outcome, especially for the firm's equityholders.

[3] These results are consistent with a recent paper by Denis and Mihov (2003).

debt compensate lenders for this increased risk by agreeing to include bond covenants in their debt contracts. Finally, we find that supply-side factors affect the covenant choice decision as well. Bonds that are issued to a large syndicate of lenders are more apt to include covenants, as are bonds issued to broker / dealers (investment banks). We believe that both the number of lenders and the identity of the lender are proxies for risk – risk that can be reduced but not eliminated through the use of covenants. We base this interpretation on our finding that the promised yields on loans from investment bankers and loans made by large syndicates are significantly higher than the promised yields on loans made by an individual commercial bank.

The remainder of this paper is organized as follows. In Section 2 we review the CCH and its predictions. We enumerate the many ways managers can expropriate the wealth of the firm's bondholders to the benefit of its stockholders. We show how the use of certain covenants can mitigate the negative effects of such opportunistic behavior on the part of corporate managers. In Section 3 we review the empirical literature on the use and effects of bond covenants. Section 4 describes our sample and provides some basic statistics for the variables used in our statistical analysis. In Section 5 we present the statistical model that we use to estimate simultaneously our "loan pricing equations" and our "covenant inclusion equations." The results of our empirical tests of the CCH are reported in Section 6. We first present the results of our estimates of the "loan pricing equations," and then present the results of our estimates of the "covenant inclusion equations." We summarize our empirical results and draw conclusions in Section 7.

2. Debt, Agency Costs and the Costly Contracting Hypothesis (CCH)

2.1 The Costly Contracting Hypothesis

The CCH is based on the contract theory of the firm, as articulated by Jensen and Meckling (JM) (1976). In their seminal paper, JM view the corporation as a nexus of contracts made between and among the firm's various stakeholders. They stress that their theory of the firm is a theory of contracts or contractually bargained for ownership rights, although they recognize that the allocation of these property rights determine what is typically thought of as the firm's capital structure.

In the JM analysis, the ownership structure decision is three-dimensional. Although all three dimensions are determined simultaneously, we will discuss each as though they were separate decisions. The JM analysis contemplates an individual owner / manager (entrepreneur) who, because of a wealth-constraint or risk aversion, has decided to "go public" and issue ownership claims to outsiders. The first decision then, is to determine the fraction of the claims to the firm's cash flows that should be sold to outsiders. JM show that the optimal division between inside and outside ownership is that which minimizes the agency costs engendered by the separation of ownership and control.

If left to their own devices, managers (insiders) will, at times, pursue operating strategies that benefit themselves at the expense of the outside owners. Moreover, the lower the fraction of inside ownership, the greater is the incentive for insiders to pursue personal benefits at the expense of the outsiders. Outside investors will anticipate the potential for wealth transfers by insiders and will price-protect themselves by offering a lower price for a given fractional ownership claim. Thus, inside managers pay ex ante (when the claims are issued) for any ex post expropriations they might attempt (once they obtain funds from the outsiders). Since insiders bear these costs, they have an incentive to minimize them. They do so by adopting the optimal split between inside and outside ownership and providing assurances to outsiders by entering into monitoring and bonding agreements (contracts). Managers bond the claims of outsiders by providing collateral in the form of firm-specific assets. Managers also commit to provide information in a timely fashion so that the firm's board of directors, the SEC, the financial press and the exchanges on which the securities trade can monitor their activities. Installing an "independent" board of directors is another monitoring mechanism that firms often employ to reduce agency costs.

Presumably, these monitoring and bonding activities induce outsiders to pay more for a given claim to the firm's cash flows. Thus, the problem facing the entrepreneur is to choose the level of outside ownership and an amount of monitoring and bonding activities to maximize:

$$\text{Wealth} = \alpha\ V(\alpha, MB) + (1\text{-}\alpha)\ V(\alpha, MB) - AC(\alpha, MB, RL) \qquad (1)$$

where α is the fraction of the firm retained by the entrepreneur (insider), V is the value of the firm when α=1, and AC are the agency costs engendered by the separation of ownership and control, which are presumed to be equal to 0 when α=1. In general, agency costs are inversely related to α and the amount spent on monitoring and bonding activities (MB), and positively related to the residual loss (RL), which is the dead-weight cost of the corporate form that cannot be eliminated through contracts. Notice that with positive agency costs, going public diminishes the wealth of the entrepreneur. Thus, either a wealth constraint or risk aversion is assumed to be the motivating force behind the entrepreneur's decision to go public.

The second dimension of the ownership structure decision is the proportion of fixed claims (bonds) and residual claims (equity) to be sold to outside investors. This is the more traditional capital structure decision. Consistent with their analysis of the decision to go public, JM argue that the division of outside financing between debt and equity claims is again an exercise in minimizing the attendant agency costs. They point out that under certain circumstances, particularly when a firm is in financial distress, managers have an opportunity and incentive to take actions that enhance the wealth of the firm's stockholders at the expense of its bondholders. Since bondholders would anticipate these situations, they would price-protect themselves when they bought the firm's debt. Once again, since the entrepreneur incurs these so-called agency costs of debt, he has an incentive to take actions to reduce them. Note that since the firm could avoid the agency costs of debt altogether by not issuing any risky debt, there must be some offsetting benefits like taxes or signaling from leverage.[4]

The potential for insiders to expropriate the wealth of outsiders is obvious. Insiders can consume outsiders' wealth through excessive compensation packages, self-dealing transactions, the over-consumption of corporate perks, shirking and outright theft. However, the ways in which stockholders can expropriate the wealth of bondholders are much more subtle.

For example, issuing debt of equal or higher seniority transfers wealth from pre-existing bondholders to the firm's stockholders. Unless the former group anticipated the

[4] See, for example, Harris and Raviv (1991) or Graham (2003) for a general discussion of the relevant issues.

subsequent bond issue and priced their debt accordingly, selling bonds of equal or higher priority will reduce the value of the pre-existing debt because of its diminished priority, and increase the value of the outstanding equity. Another mechanism to transfer wealth from bondholders is for the firm to take on projects that have higher-risk than bondholders had anticipated when they purchased their securities. This practice is referred to in the literature as "asset substitution" or the "over-investment problem." Under certain circumstances, the firm might even take on negative net present value projects if the probability of default on the existing debt and the potential payoff to the project are both sufficiently high. Note that such situations would arise primarily in firms that are in some degree of financial distress. That is why the agency costs of debt are often referred to as near-default costs: but for the firm's financial difficulties, managers would not have an incentive to deviate from the Market Value Rule.[5]

Myers (1977) notes that the managers of a levered firm would find it in their interest to forego positive net present value projects, if most of the benefit of the projects flowed to the firm's bondholders. He argues that this so-called "under-investment problem" would be most acute for growth firms – firms that have an abundance of positive net present value projects in which to invest. Myers likens these positive NPV projects to real options and argues that the ability of the managers to let these options expire if the net benefits were to inure primarily to the firm's bondholders creates an agency cost between stockholders and bondholders.

The third dimension of the firm's capital structure decision is the design of the firm's debt securities. There are an infinite variety of debt securities that the firm could issue. The parameters of this decision include the priority of the debt, its maturity, call and conversion provisions and protective covenants. As is the case in determining the optimal mix between inside and outside securities, the design of bond contracts involves the tradeoff between the promised yield and the costs imposed on the borrower by including covenants in the bond agreement. Presumably, the more constraining are the bond covenants, the lower the firm's cost of debt capital. This is the CCH as it applies to the firm's capital structure decision.

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[5] See for example Bradley, Jarrell and Kim (1984)

Smith and Warner (SW) (1979) argue that if the CCH is correct, then we should observe restrictions (covenants) written into indenture agreements. They then sought and found a number of the restrictions that had been predicted by their theory in a publication of the American Bar Foundation entitled *Commentaries on Model Debenture Provisions* (1971). They then proceeded to argue that since the restrictions imposed by these covenants are costly to the firm, they must confer some offsetting benefit. And that benefit, they argue, is the reduction in agency costs, which translates into a lower cost of debt. Thus, the tradeoff is between the costs imposed by the (costly) contracts, and a lower cost of debt.[6] SW provided little empirical support for this conclusion, beyond documenting the existence of the covenants themselves. Our objective in this paper is to put the CCH to a more rigorous set of empirical tests regarding the use of covenants.

2.2 The Agency Costs of Debt and Possible Covenants to Reduce Them

As briefly mentioned above, there are a number of ways that stockholders can expropriate wealth from bondholders. In this section we describe in more detail the most common mechanisms to affect such transfers and suggest how bond covenants can be used to reduce or even eliminate the incentives to pursue these strategies.

2.2.1 Unauthorized Distributions

An obvious way in which managers can expropriate the wealth of the firm's bondholders is to liquidate the firm's assets and distribute the proceeds to its stockholders in the form of a dividend or a premium share repurchase. The potential for such blatant

[6]An analogy from Greek mythology is often cited to illustrate the effects of bond covenants on managerial behavior. Recall the story of Ulysses, who, returning from the Trojan wars, realized that his homeward route would take him past the island of the Sirens. Ulysses knew of the Sirens and of their practice of luring unsuspecting sailors into the hazardous reefs that surrounded their island with their alluring, melodious songs. Ulysses wanted to hear the songs of the Sirens but realized that their mesmerizing songs would entice him to sail his ship into the surrounding reefs and send his ship crashing to the bottom of the sea. So, in order to avoid such a catastrophe, while still being able to hear the Sirens' songs, he ordered his men (the Argonauts) to put wax in their ears and lash him to the mast of the ship. That way, Ulysses could hear the Sirens yet not put his men in danger by steering the ship into the island's reef.

Like Ulysses, corporate managers can use bond covenants to "lash themselves" to the masts of their firms by voluntarily constraining their behavior, especially in times when the firm is in financial distress and the management is lured by the Sirens' songs to expropriate wealth from the firm's bondholders. If bondholders believe that the covenants are sufficient protection from subsequent expropriations, they will pay more when the bonds are issued, which is to say they will agree to a lower interest rate over the life of the bond.

theft under the cloak of the public corporation is so great that most state legislatures have enacted "fraudulent conveyance" statutes that prohibit such activity and serve as a blanket protection for all creditors. In a sense fraudulent conveyance laws represent an implicit set of covenants that are a part of all debt contracts. Beyond fraudulent conveyance laws, covenants can be written that restrict the payment of dividends outright or designate that dividends only be paid out of earnings. Alternatively, covenants can restrict the firm from generating cash flows outside of its normal course of business by precluding the sale of assets or the issuance any new securities unless the firm receives bondholder approval or retires a portion of the outstanding debt.

2.2.2 Claim Dilution

Managers can dilute the holdings of existing bondholders and enhance the wealth of the firm's stockholders by issuing higher-priority debt. In the event of default, the new debt will enjoy a higher priority in liquidation and the new bondholders will pay a premium for this superior position. The firm's stockholders will reap the benefits of this premium. The value of the pre-existing debt will fall because of its lower priority in the event of liquidation. The most common covenant designed to prevent this form of expropriation of bondholder wealth is a *negative pledge clause*, which specifically prohibits the firm from issuing additional debt with equal or higher priority. These covenants are what Fama and Miller (1974) refer to as "me first clauses."

2.2.3 Asset Substitution (Over-Investment)

The equity of a levered firm is like a call option on the firm's assets, with an exercise price equal to the promised payment to bondholders. When a firm is in financial distress, and it is likely that the firm will default on its obligation to bondholders, managers have an incentive to invest in high-risk, high-expected return projects, even if the projects have negative NPVs. The logic is that with limited liability, stockholders can only lose their investment in the firm. Thus, they stand to realize most (all) of the upside profits, while bearing little (none) of the downside risk.

Clearly there is no way to write an enforceable contract that commits the firm to never undertake a negative NPV project or to prevent the firm from taking risky projects, in general. However, covenants that prevent the firm from selling or acquiring assets without bondholder approval preclude the firm from pursuing the most obvious opportunities to change the risk profile of the firm quickly and dramatically.

2.2.4 Under-Investment

The managers of a levered firm may elect to forego a positive NPV project if the firm's bondholders would realize the benefits of the project. This is the under-investment problem described by Myers (1977). Presumably, transaction costs prevent the managers of these firms from bargaining (renegotiating) with the firm's bondholders as would be predicted by the Coase Theorem.[7] Moreover, it is virtually impossible to write a covenant that will commit managers to take on all positive NPV projects. Some have argued that covenants that restrict dividends reduce the under-investment problem.[8] However, unless these covenants also preclude share repurchases or the retirement of debt, dividend restrictions would not be a constraint. Myers suggests that (high-growth) firms will either issue little or no debt, or issue only short-term debt

2.3 Implications of the Costly Contracting Hypothesis

Although all levered firms face the agency costs of debt, there are certain firms for which these costs are more severe than others. JM argue that firms that are in financial distress have greater incentives to resort to one or more of the actions described in the previous sub sections. In addition, firms in financial distress are more likely to incur the costs of bankruptcy.

As discussed above, Myers argues that firms with significant growth opportunities will be more susceptible to the under-investment problem because of the option-like features of their production / investment decisions. Consequently, based on the analysis of JM and Myers, the Costly Contracting Hypothesis (CCH) predicts that the agency costs of debt will be greater for firms in or near financial distress and firms with high-growth opportunities.

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[7] The Coase Theorem states that all profit opportunities or mutually beneficial transactions will be exploited up to transaction costs.
[8] Smith and Warner (1979).

Of course the main prediction of the CCH is an inverse relation between covenant inclusion and the promised yield on the debt. The CCH also predicts an inverse relation between covenant inclusion and (1) the firm's size and (2) the state of the economy, both variables relating to the probability of default. The CCH predicts a positive relation between covenant inclusion and (1) the amount of debt currently outstanding and (2) the maturity of the debt being issued.

3 The Existing Empirical Literature on Bond Covenants

As mentioned previously, the SW study was the first systematic empirical examination of bond covenants. [9] Based on their analysis of the American Bar Association publication *Commentaries*, SW categorized bond covenants into five groups: covenants that (1) restrict the firm's production / investment policy; (2) restrict the payments of dividends; (3) restrict the firm's subsequent financing policy; (4) modify the pattern of payoffs to bondholders; and (5) specify bonding activities by the firm. SW argued that under certain circumstances, including a set of these various covenants in an indenture agreement would reduce the promised yield to bondholders. Although this direct implication of the SW analysis has not be subjected to rigorous empirical testing (indeed, that is the purpose of this paper), there have been a number of papers testing other implications of the SW analysis.

A study by Malitz (1986) involving 252 public debentures issued by 223 firms reports a negative relation between the presence of covenants and the size of the firm and the firm's leverage ratio. This finding is consistent with the CCH.

In a 1994 study, Begley examined 130 non-convertible public debentures issued between 1975 and 1979. She finds that firms with a higher probability of bankruptcy, less assets in place and generating less operating cash flows are more likely to include covenants that restrict dividends and additional borrowing. The use of other covenants is related to some, but not all of these variables. By and large her study supports most of

[9] An interesting aspect of this paper, from an historical perspective, is that it was one of the first finance papers that did not contain one equation or one summary statistic in the entire text. Indeed, it was debated at the time whether or not it was true finance scholarship since "it didn't have any t-Statistics in it." The vast literature, both theoretical and empirical, that the paper has spawned since its publication is evidence that it was indeed valid academic research.

the predictions of the CCH regarding the characteristics of firms that include covenants in their debt contracts.

Kahan and Yermack (1998), in a study of 64 convertible and 128 non-convertible public bonds issued in 1993 and 1994, found that not one of the convertible bonds in their sample contained any restrictive covenants. In other words, covenants and convertibles appear to be substitutes. They go on to argue that the higher the firm's growth opportunities the more costly the restrictions imposed by covenants and the less costly is the price of convertibility. Thus, according to the CCH, firms with high growth opportunities should opt for convertible bonds. And that is what they find. They document a positive relation between the use of convertible bonds and a firm's growth opportunities as measured by the firm's ratio of market capitalization to book assets.

Begley and Feltham (1999) examined 91 senior non-convertible public debentures between 1975 and 1979. They focused on dividend restrictions and negative pledge clauses (the prohibition of issuing additional debt). They hypothesized that "Large CEO cash compensation align CEO's interests with those of debtholders, while large CEO equity holdings are hypothesized to align the CEO's interests with equityholders. The evidence suggests that debtholders are more concerned about managerial opportunism when the CEO receives less cash compensation, has a larger ratio of stock wealth to cash compensation, and holds a larger fraction of a firm's common equity." In a two-stage regression, they find that only the ownership variable is significant.

Malitz (1986) studied 252 public debentures issued by 223 firms in 1960 and 1980. He recognizes that dividend restrictions and financing restrictions are complements. Where you find dividend restrictions you will also find restrictions based on a firm's accounting numbers. He finds that size, which he argues is a proxy for symmetric information, and low leverage lead to fewer covenants.

Goyal (2001) analyzes <u>bank issuances</u> of subordinated public debt. He finds a negative relation between the value of a bank's charter, a measure comparable to Tobin's Q, and the incidence of bond covenants in the indenture agreement. His focus is on restrictions on investment policy and dividends. He concludes that bank debtholders discipline bank managers by paying a lower price (require a higher yield) for subordinated debt without covenants. This is direct evidence that covenants are priced, at least in terms of the market for bank charters.

In a recently published paper Nash, Netter and Poulsen (2003) report evidence that they interpret as inconsistent with previous tests of the CCH. They find a negative relation between the incidence of covenants and growth opportunities. Instead of rejecting the theory outright, they argue that for high-growth firms, the constraints imposed by bond covenants is greater than the benefits of a lower rate on the company's debt. They conjecture that high-growth firms require a high degree of flexibility in their operating and financing decisions, and that bond covenants would be too constraining for these firms.

By and large, the broader empirical literature is consistent with the prediction of the CCH that high-growth, high-risk firms use less debt[10] with shorter maturities.[11] Moreover these firms are more apt to issue convertible bonds with no covenants attached.[12]

There are, however, several limitations of the existing empirical studies that we hope to overcome in this paper. First is sample size. Our sample consists of over 14,000 loans issued to 3,064 firms during the period 1990-2001. None of the studies discussed above even approach the size, coverage and time-span of our sample, which not only offers increased statistical power but an ability to examine macroeconomic effects, as well. Second, much of the empirical literature is based on samples of public debt issues. It is generally accepted, and often noted, that covenants written into public debt instruments are virtually impossible to renegotiate. The inability to negotiate and, more important, renegotiate, the terms of an agreement with the many owners of a public debt issue render all but boilerplate covenants useless in the public debt market. This implies that the appropriate and effective use of covenants can be better understood by studying privately placed debt, which we do in this paper. Third, examining private debt enables us to examine the impact of supply-side factors on covenant inclusion because of the concentration of lenders. As with macroeconomic factors, this dimension of the

[10] Barclay and Smith (1995A).
[11] Barclay and Smith (1995B).
[12] Kahan and Yermack (1998)

contracting process has received little, if any, attention in previous studies and can potentially shed further light on the CCH.

Finally, Houston and James (1996) show that the mean percentage of public debt held by the firms in their sample is only 17% of their total outstanding debt, with the majority of firms using intermediated (e.g., bank) debt, exclusively. Indeed, Figure 1 provides a graphical comparison of proceeds from our sample of private debt with proceeds from public debt issuances during the period 1990-2001, as reported by SDC. The data show that since 1994, the amount of private corporate debt issued swamps the amount of public debt issued, ranging from two to three times the amount on an annual basis. Clearly, the private corporate debt market is far larger than the public market and therefore warrants more attention. The data suggest that in order to fully understand corporate capital structure one must study the private debt market as well. We now turn to a more thorough discussion of our data.

4. Data and Summary Statistics

4.1 Sample and Loan Characteristics

Our sample of private corporate debt is an August 2002 data extract from Dealscan, a database created and marketed by Loan Pricing Corporation (LPC). The database contains detailed loan information for U.S. and foreign commercial loans made to corporations and government entities during the period 1990 to December 2001. According to Carey and Hrycray (1999), the database contained between 50% and 75% of the value of all commercial loans in the U.S during the early 1990's. By 1995, Dealscan contained the "large majority" of sizable commercial loans. According to LPC, approximately half of the loan data are from SEC filings (13Ds, 14Ds, 13Es, 10Ks, 10Qs, 8Ks, and registration statements). The other half is obtained from contacts within the credit industry and from borrowers and lenders.

Since our analyses require borrower information, we merge the loan data with the quarterly COMPUSTAT files.[13] The sample is then restricted to non-farm and non-financial corporate borrowers entering into US dollar denominated loans, for which

[13] We merge the datasets by ticker and loan date, appending COMPUSTAT information measured in the quarter prior to the initiation of the loan. We also hand check our merging algorithm by comparing company names from both the Dealscan and COMPUSTAT databases.

Dealscan contains valid data for the amount, maturity and price of the loan. The resulting sample contains 14,112 loans to 3,064 unique firms, during the period 1990-2001.

Table I presents longitudinal view of our loan database. The basic unit of observation in Dealscan is a loan, also referred to as a "facility" or tranche. (We use the term loan in the tables.) Since most firms enter into multiple loans at the same time, loans are often grouped into deals or "packages". For example, in May of 2001 IBM entered into a $12 billion deal consisting of two loans: a short-term, 364-day facility for $4 billion and a 5-year revolving line of credit for $8 billion. While each loan has only one borrower, many loans have multiple lenders due to syndication. That is, loans are often underwritten and financed by a consortium of banks and/or other financial institutions (e.g. insurance companies, pension funds, etc.).

Loan information varies across loans but almost always includes the borrower, lender, loan type, deal purpose, loan amount, maturity and pricing. There are 23 different types of loans represented in our sample, differing in the general structure of the loan (e.g., maturity, repayment, purpose, etc.). For presentation purposes, we only show the fraction of loans attributable to three of the more common types: 364-day facility, revolving loans and term loans.[14] Revolving loans that enable borrowers to drawn down capital over time, comprise the majority of loans in our sample. Term loans requiring a complete withdrawal of funds at inception represent roughly 24% of the loans. Finally, 364-day facilities - short term, revolving credit used to avoid the capital allocation banks are required to make on un-funded commitments of a year or more – is the third major loan type in our sample. Interestingly, these short-term facilities have grown increasingly popular over time. However, revolving and term loans continue to make up the majority of loans throughout the sample period.

The purpose of each loan is categorized into 26 groups. As with the type of loan, we only present the fraction of loans attributable to the more popular categories: corporate purposes, debt repayment, takeovers and working capital.[15] General-purpose loans (i.e. corporate purposes and working capital) form the plurality of loans in our sample, whereas debt repayment is the single most popular loan purpose. Project-specific

[14] A complete distribution of loan types is available from the authors upon request.
[15] A complete distribution of deal purposes is available from the authors upon request.

finance (not shown) represents a very small fraction of the loans in our sample (and in the entire Dealscan database). Examination of time-variation in loan purpose reveals that debt repayments are pro-cyclical and general-purpose loans are counter-cyclical.

Table I also shows that even aggregated loan details can vary greatly over time. Promised yields, measured in basis points above the 6-month LIBOR, range from a low of 165 in 1997 to a high of 228 in 1991. Dealscan refers to this measure as the All-in-Drawn Spread (AIS), which represents the cost to the borrower for each dollar withdrawn.[16] LPC computes this figure as the sum of the coupon spread and any recurring fees (e.g. annual fee). For loans not based on LIBOR, LPC converts the coupon spread into LIBOR terms by adding or subtracting a constant differential reflecting the historical averages of the relevant spreads.[17] The AIS enable comparisons to be made across multiple facilities, independent of the underlying fee and rate structure. In our empirical analysis we use the AIS as the promised yield of the debt.

Loan maturities are, on average, approximately 3.5 years and vary relatively little over the duration of our sample. Average loan sizes range from $152 million in 1992 to over $318 million on 2001. Finally, we see a dramatic increase over time in the fraction of loans with a performance pricing feature, which ties the pricing of the loan to a measure of firm performance (e.g., net worth, interest coverage, etc.): the poorer the performance, the higher the interest charge.

Also included in the Dealscan database is covenant information. We focus on six specific covenants, which fall into four groups: prepayment, financial, dividend and secured. The prepayment group includes covenants that mandate early retirement of the loan conditional on an event, such as a security issuance or asset sale. These covenants are referred to as “sweeps” in the loan documents and the database contains information on three types: equity, debt, and asset. Sweeps are stated as percentages, which correspond to the fraction of the loan that must be repaid in the event of a violation of the

[16] LPC also reports a measure All-in-Spread Un-drawn, which represents the cost to the borrower for each dollar available under commitment but not withdrawn. Since this measure primarily reflects an opportunity cost for the bank, we use the All-in-Spread Drawn measure in our analysis.

[17] As of 8/31/2002, the differentials used in the calculation of AIS reported by LPC are: +255 basis points (BP) for the prime rate, +3 BP for the commercial paper rate, -34 BP for the T-bill rate, -18 BP for bankers’ acceptance rate,–6 BP for the rate on CDs, and 0 BP for the federal funds rate, cost of funds rate and money market rate. Hubbard et al. (2002) show that replacing these constants with time-varying differentials based on year-specific average spreads has a minimal effect on any pricing implications.

covenant. For example, a contract containing a 50% asset sweep may specify that if the firm sells more than a certain dollar amount of its assets, it must repay 50% of the principal value of the loan. From Table 1, we see that asset sweeps are the most popular prepayment restriction (62.5% of loans) followed by debt (46.2%), and equity (45.9%) sweeps. Over time, usage of each type of sweep appears to grow quite significantly and coincides with a counter-cyclical pattern over the period 1993-2001.

Financial covenants refer to restrictions on the level of different financial accounting variables. The sample of loans contains covenants on 17 different accounting variables, including the interest coverage ratio, current ratio, leverage and net worth. The average loan restricts 2.5 financial variables, with the most popular covenants restricting the ratio of debt to operating income and tangible net worth. In a number of loans, the financial covenants contain a "trend," in that the threshold (minimum or maximum level, depending on the variable) changes over the life of the loan. For example, National Health Laboratories Inc. took out a five-year loan in 1994 that restricted its interest coverage ratio to remain above 4.5 during the first 15 months, above 5 during the next year, above 5.5 during the following year and above 6 for the remainder of the loan. This tightening of covenant restrictions over time is referred to as "build ups" in the trade.

Dividend covenants simply restrict the ability of the firm to distribute cash to its stockholders in the form of dividends. This restriction is represented in the database by a binary variable indicating the presence of such a restriction. While the data are fairly straightforward, the actual contracts are quite detailed in terms of the precise nature of the dividend restriction. They often specify the maximum amount, frequency and recipients of the dividends, in addition to sometimes conditioning the payments on measures of credit worthiness, such as credit ratings and financial ratios. Table 1 shows that over 85% of the loans in our sample contain a dividend restriction. In comparison, Nash, Netter and Poulsen (2002) report that only 30% of publicly issued debt contains a dividend restriction, consistent with the prediction that private corporate debt contains significantly more covenants than public corporate debt.

As with dividend restrictions, secured debt is indicated simply by a binary variable, although contracts contain detailed security agreements and subsidiary guarantees. Similar to dividend restrictions, the large majority of our loans (78%) are secured, unlike the typical public debt issue. Nash, Netter and Poulsen (2002) report that only 18% of their sample of public debt issues is secured.

Several final comments concerning the covenant data are in order. First, covenants are unique to packages, so that every tranche in a package is covered by all of the covenants. While violation of a covenant may lead to renegotiation of only one or more specific tranches, the entire deal is often in technical default upon violation of one of the covenants. Second, as alluded to in the preceding discussion, the precise nature of individual covenants is quite complex. A quantitative measure encapsulating all of the details of each covenant is infeasible. As such, we restrict our empirical measure for each covenant to be a binary variable representing the presence of a covenant in the loan contract. These definitions also ease interpretation of our results and provide a link with previous research on debt covenants. Third, the data show that, consistent with the CCH, private corporate debt is laden with covenants. The average loan in our sample contained covenants pertaining to almost 3 different financial ratios. 78% of the debt is secured; 85% contain a dividend restriction. More than half of the loans contain provisions for asset sweeps; about half include debt and equity sweeps.

4.2 Borrower Characteristics and the CCH

Panel A of Table II presents summary statistics of firm characteristics for our sample of private debt issuers. For comparison purposes, we construct a sample of public debt issues, taken from the New Issues Database provided by SDC. Included in this sample are all convertible and straight-debt issues offered to the public from 1990 through 2001. We also collect accounting information for these firms from COMPUSTAT during this time period. Summary statistics for our sample of public debt issuers are presented in Panel B of Table II.[18]

The CCH implies that high-risk, high-growth firms have an incentive to issue private debt, since private debt allows borrowers and lenders to write enforceable and re-

[18] The following adjustments have been made to both samples to address the effects of outliers and data coding errors: Market Leverage, PPE/Book Assets and LT Debt / Total Debt are restricted to the unit interval, Market-to-Book is required to lie between one and 20, and the P/E ratio is bounded below by 0 and above by 100. All dollar values are inflation-adjusted to December 2000 dollars using the All-Urban CPI. Similar adjustments are common among many empirical studies using the COMPUSTAT database (e.g. Baker and Wurgler (2002), Frank and Goyal (2003) and Leary and Roberts (2003))

negotiable contracts (covenants). This is not to say that these firms issue no public debt at all. It is just more costly for them to do so. When high-growth firms do venture into the public market, they are constrained by market forces to favor short-term, convertible and highly secured issues. Therefore, the theory predicts that the firms in our sample of private debt would be smaller, more risky, have higher Market/Book ratios, greater R&D expenditures, lower leverage, less tangible assets and more covenants in their debt than firms that resort to public markets. As we will see, many of these unconditional predictions are borne out by the data.

Before we proceed, however, a word of caution is in order regarding the testability of the CCH. It is difficult to test the hypotheses directly, since the theory applies to the characteristics of a particular firm and do not necessarily hold in a cross-sectional analysis. For example, the theory predicts that because of potential wealth-transfers from bondholders, a firm with high growth opportunities, however defined, should have little public debt. However, suppose that the firm could eliminate the possibility of any significant wealth transfer from bondholders or, equivalently, eliminate the incentives of stockholders to attempt any expropriation by entering into a simple agreement (contract), which would impose little or no costs on the firm. Under these conditions we could observe a high-growth firm with a lot of debt. The point is that the cost of debt is only as great as the least cost method of eliminating the attendant agency costs. Thus, if we see a high-growth firm with significant public debt, we could conclude that the CCH is invalid, or we could conclude that the attendant agency costs are low for that firm. There is no direct way of refuting the latter conclusion. However, we believe that the agency costs of debt, as embodied in the CCH, are sufficiently important that they have a material effect on the firm's capital structure choice and the resulting cost of capital.

Comparing the entries in Panel A of Table II with the entries in Panel B of the table, we see that firms in the Dealscan sample (private debt borrowers) are significantly smaller in terms of sales, assets and market capitalization than firms that issue public debt. They also have relatively fewer tangible assets (PPE / Book Assets), a shorter maturity structure of debt (LT Debt / Book assets), and greater growth opportunities (R&D / Book Assets and market-to-book), although this last relation is tenuous and holds only for the sample mean. These results are all consistent with the CCH. However the lower leverage, higher profitability and higher Z-Score found in the Dealscan sample is arguably inconsistent with the CCH. These inconsistent relations may be attributable to the smaller size of firms in the private debt sample. Thus, while there is some preliminary evidence consistent with the CCH, more formal analysis is required.

5. Testing the CCH

At best, the data in Table II weakly support the implications of the CCH. However, these data present a very rough, unconditional analysis that does not address the conditional nature of the data generating process. We now begin a more formal analysis in order to isolate potential confounding factors in our effort to determine whether bond covenants are priced.

5.1 Pair-Wise Correlations

Table III reports estimates of the Pearson correlation coefficient between several key variables in our bond sample. P-values that distinguish a zero-null hypothesis from a nonzero-alternative hypothesis are presented in parentheses.[19] Going down the first column of the table, we see that the promised yield is positively related to maturity – longer-term debt commands a higher promised rate. The third variable is the market cap, which is negatively correlated with the yield. Large firms have the assets and brand-name capital to provide collateral for their bondholders and are thus able to obtain favorable rates with lending institutions. Continuing down the list of variables, yield is negatively related to the market-to-book ratio. This implies that high-growth firms have a <u>lower</u> cost of capital. This finding is in clear contradiction of the CCH, which posits a positive relation between yield and the ratio of market to book. Lenders should be compensated for the risk they are assuming. As we will see, this result is due to not holding other parameters of the debt contract constant.

The remaining variables in the table are binary indicators of the various bond covenants found in our sample. Note that all of the bond covenants are <u>positively</u> related

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[19] The test-statistic is $(N-2)^{1/2} * [r / (1-r^2)^{1/2}]$, where N is the number of observations and r is the sample correlation coefficient. This statistics has an asymptotically standard normal distribution under the null hypothesis that r = 0.

to the promised yield and highly statistically significant. This implies that firms that include covenants in their debt pay a higher rate for their debt. This finding is also inconsistent with the CCH. According to this theory, covenants should be a tradeoff with the promised yield. Again, we will show that this result is due to not holding other factors constant.

Note that the correlations reported in the first column of the table are all highly significant. Nine of the ten independent variables have P-Values less than .005, and the tenth is less than .05. As will be shown subsequently, our pricing models, which are based on these same variables, are highly significant as well, with R^2s that range from 36% to 61% and average 48%.

Finally, note that the correlations between each of the covenants, except the covenant involving net worth, are all positive (the outlined box in Table III). Others have noted a positive correlation among bond covenants.[20] This finding is neither new nor surprising. If it behooves a firm to provide a covenant along some dimension of the firm's operations, then it does no good if the firm does not preclude what is essentially the same activity. For example, it would be useless to restrict the distribution of dividends without restricting premium share repurchases as well. Moreover, some of the categories we have labeled covenants are in fact consequences of each other. For example dividends are rarely prohibited outright. Rather, covenants require the firm to suspend dividends if certain financial measures are not held to pre-specified levels. Thus, it is not surprising that many debt instruments that contain financial covenants also contain dividend restrictions.

Closer inspection of the data in Table III reveals that certain covenants are more highly correlated with each other than others. For example, sweep covenants (asset, debt and equity) have the strongest correlations among all those presented in the table, suggesting that the average contract either includes all sweep covenants or none at all. Further analysis (not presented) reveals that this is indeed the case. Of loans with available sweep data, 35% contain none of the three sweep provisions and 35% contain all three. Of the remaining 30%, 26% contain an asset sweep in combination with either a debt or equity sweep. Again, this is not surprising given that all three sweep provisions

[20] See Begley (1994).

limit a firm's ability to raise funds in external capital markets in one form or another. The correlations among the sweep provisions notwithstanding, we do see significant variation between pairs of other covenants suggesting a good deal of variation in covenant structure.

The troubling findings in Table III for the CCH are the fact that promised yield is negatively related to the firm's growth opportunities and positively related to the presence of protective covenants. The theory would predict just the opposite.

As we show subsequently, single-equation relations are insufficient to measure the determinants of the yield to corporate debt.[21] For example, in the above case, the positive relation between covenants and yield masks the fact that the covenants are a proxy for risk. Risky, long-term bonds are laden with covenants. Thus, unless the underlying risk of the debt is held constant (modeled), a positive relation is expected. After presenting some non-parametric relations, we present just such a model.

5.2 Loan Portfolios

As mentioned in the previous section, the necessity of controlling for variation in risk when testing the CCH is crucial. Table IV presents a first attempt to control for the variation in risk across loans by constructing loan portfolios based on quintiles of two borrower attributes: size (market capitalization) and growth opportunities (market-to-book). The table presents the fraction of loans in each portfolio containing each of seven covenants: secured debt, dividend restrictions, at least two restricted financial ratios, net worth covenants, and asset, debt and equity sweeps. For example, the first panel in the table indicates that 98% of the loans in the smallest size and lowest market-to-book quintile are secured, while 43% of the loans in the largest size and highest market-to-book quintile are secured.

Also presented in Table IV are loan portfolios constructed by size and promised yield quintiles. For example, of the loans in the largest size and highest promised yield quintile, 85% are secured and 97% contain a dividend restriction. The purpose of these

[21] Others have noted the simultaneity of the many dimensions of the capital structure decision. See Barclay and Smith (1995a, 1995b), for example.

portfolios is to determine if the positive relationship between yields and covenants found in Table III persists, even after controlling for an important risk factor such as size.

The data in Table IV reveal a number of distinct patterns. First, note that the percentage of firms containing debt covenants falls dramatically, although not monotonically, as the size of the firm increases. This is true for all of the covenant categories, regardless of the market-to-book or promised yield quintile. Thus, in general, large cap firms are less likely to include covenants in their debt. However, from table IV, note that the promised yield also falls as the size of the firm increases. This implies that size is a substitute for bond covenants. In fact, as we will see, size is the single most important variable in predicting whether or not a firm will include a covenant in its debt contracts.

The second general impression that one gets from the data in Table IV is that the negative association between market-to-book and several covenants found in Table III is no longer clear. Holding size constant, the fraction of loans that are secured is constant, if not increasing in the market-to-book ratio; and similarly for dividend restrictions. For the larger size quintiles, the fraction of loans containing more than 2 restrictions on financial ratios is also increasing in the market-to-book ratio. The relationship for the sweep covenants is less clear. Thus, to the extent that market-to-book is a measure of growth opportunities, the data reveal a potentially positive relation between growth opportunities and the presence of several covenants, which is consistent with the CCH. Ultimately though, a more rigorous analysis, accounting for additional risk factors and other statistical concerns is necessary.

Finally, the data in Table IV show a positive relation between promised yield and the proportion of loans that contain covenants, even after controlling for size. For most of the size quintiles and most of the covenant categories, the proportion of firms that include covenants is positively related to the promised yield. This result is inconsistent with the CCH. By and large the data indicate that the presence of a covenant is associated with a higher promised yield. The CCH predicts that the presence of covenants will reduce the rate on a firm's debt. As we will see in the subsequent sections, this perverse result is due to the covenant acting as an instrumental variable for risk. Once risk is held constant, we expect to find, and in fact we do find, a negative relation between promised yield and the presence of bond covenants.

As informative as the data in the panels of Table IV are, we need a more powerful statistical analysis that will allow us to disentangle the effects of the many aspects of a loan agreement and focus on the marginal impact of debt covenants on the promised yield. We present such a model in the next section.

5.3 A Statistical Model of Loan Pricing and Covenant Inclusion

According to the CCH, the decision to include a covenant in a debt contract is determined simultaneously with the pricing of the contract. From the borrower's perspective, this decision amounts to weighing the costs stemming from the restrictions imposed by a particular covenant against the decrease in the cost of the loan. We use a reduced form approach to model simultaneously the pricing of a loan and the decision to include a covenant. The tradeoff facing the borrower may be represented mathematically as:

$$\frac{Price_{No\,Cov} - Price_{Cov}}{Price_{Cov}} > Covenant\ Costs\,, \tag{2}$$

where $Price_{No\,Cov}$ represents the price of a loan with no covenant restrictions, $Price_{Cov}$ represents the price of a loan with a covenant restriction, and covenant costs represent the costs imposed on the borrower by the restrictions included in the covenant in question.

The inequality in equation (2) implies that the inclusion of a covenant requires that the percentage decrease in the price of the loan be greater than the costs imposed by the covenant. The costs of the covenant can be represented as a function of proxies for potential agency costs, as well as borrower and lender characteristics. For simplicity, we assume that

$$Covenant\ Costs = \beta' X + \varepsilon. \tag{3}$$

where X is a vector of covariates, and ε is a random error assumed to be i.i.d. normal, with zero mean and variance σ^2. This set up is similar in spirit to that of Lee (1978), who models the decision to join a labor union requiring the anticipated wage increase to exceed the employee's out-of-pocket and indirect costs.[22]

Combining equations (2) and (3) reveals that a borrower will include a covenant in the loan agreement if

$$\frac{Price_{No\,Cov} - Price_{Cov}}{Price_{Cov}} > \beta' X + \varepsilon. \tag{4}$$

Using a latent variables approach, we may rewrite this specification in terms of a probit model:

$$Cov^{*} = \alpha + \delta\left(\frac{Price_{No\,Cov} - Price_{Cov}}{Price_{Cov}}\right) + \Gamma' X - \varepsilon. \tag{5}$$

where Cov^{*} is a latent variable such that when $Cov^{*} > 0$ the borrower includes a covenant; otherwise, he does not. Recognizing that

$$\frac{Price_{No\,Cov} - Price_{Cov}}{Price_{Cov}} \approx \log\left(Price_{No\,Cov}\right) - \log\left(Price_{Cov}\right), \tag{6}$$

allows us to write equation (5) in terms of the difference in the logs of the prices:

$$Cov^{*} = \alpha + \delta\left[\log\left(Price_{No\,Cov}\right) - \log\left(Price_{Cov}\right)\right] + \Gamma' X - \varepsilon. \tag{7}$$

Our model of loan prices now consists of two equations. The first corresponds to the price of loans containing a covenant and the second represents the price of loans without a covenant, both of which we model in terms of the log of prices:

$$\log\left(Price_{Cov}\right) = \alpha_{Cov} + \beta_{Cov}' X_{Cov} + \varepsilon_{Cov} \tag{8}$$

$$\log\left(Price_{No\,Cov}\right) = \alpha_{No\,Cov} + \beta_{No\,Cov}' X_{No\,Cov} + \varepsilon_{No\,Cov}, \tag{9}$$

where ε_{Cov} and $\varepsilon_{No\,Cov}$ are normally distributed random errors with mean zero and variances σ^{2}_{Cov} and $\sigma^{2}_{No\,Cov}$, respectively. Note that this specification assumes a complete interaction between covariates and covenant status in the loan pricing equation. This formulation differs significantly from simply inserting a dummy variable indicating the presence of a covenant, which is the predominate methodology found throughout the

[22] For details see Lee (1978) and Heckman (1979) for example. Goyal (2001) uses this technique to test for the effects of restrictive covenants placed on a commercial bank's operations and the market value of its charter. He finds that covenants do increase value.

literature.[23] Note also that such an approach presumes that borrower and lender characteristics are independent of the covenant decision. We show subsequently that this presumption is unwarranted.

The system to be estimated is comprised of equations (7) through (9). The estimation procedure is straightforward. First, a reduced form probit is estimated by substituting equations (8) and (9) into equation (7). The linear predictor from this estimated model is used to compute the inverse Mills ratio, which is defined as $\phi(\hat{\psi})/(1-\Phi(\hat{\psi}))$ when covenants are not included, and $-\phi(\hat{\psi})/(\Phi(\hat{\psi}))$ when covenants are included. Here ϕ is the standard normal density function, Φ is the standard normal cumulative distribution function and $\hat{\psi}$ is the estimated linear predictor from the reduced form probit estimation.

The next step is to estimate the structural pricing equations, (8) and (9), inserting the appropriate inverse Mills ratio into each regression. From these regressions, the predicted price for the entire sample (with and without covenants) is computed, excluding the effect of the inverse Mills ratio. The difference $log(Price_{No\,Cov}) - log(Price_{Cov})$ is then computed and the structural probit equation (7) is estimated. The coefficient on this difference, δ in equation (7), will reveal the partial relation between the inclusion of a particular covenant and the promised yield. A positive relation would indicate that the inclusion of the particular covenant reduces the promised yield. In other words, at the margin, covenants are priced as predicted by the CCH.

This estimation procedure ensures that the parameters of the pricing equation are consistently estimated, while allowing for the inclusion of the promised yield in the covenant probit equation in a statistically consistent manner. And, as we will see, this approach explicitly highlights the bi-directional effects of covenants and loan prices.

6. Estimation Results

6.1 Loan Pricing Results

Table V reports the estimates of our loan pricing equations for six bond covenants: dividend restrictions, secured, financial covenants, asset sweeps, debt sweeps

[23] The Nobel Laureate George Stigler was fond of saying that dummy variables are aptly named.

and equity sweeps.[24] Robust t-statistics, which account for clustering at the company level, are reported in parentheses. For each category, we estimate separately a loan-pricing equation with the sample of firms that have the indicated covenant and those that do not. Panel A contains our results for dividend restrictions, secured and financial covenants. Panel B reports the results for the asset, debt and equity sweeps.

The definitions of the independent variables can be found in the description of the table and will be discussed below. However, before proceeding we note that the pricing equations contain a number of fixed-effects variables, which are not reported in the table. These binary variables include 1-digit SIC codes, deal purposes and loan types.

We recognize that the six equations reported in Table V are not independent. As indicated in Table 1, a number of loans contain more than one covenant. Thus, the same loan may appear in a number of the six equations. However, the correlation between covenants is by no means 1.0, as we saw in the previous section. By examining each covenant separately, our analysis illuminates both the commonalities and differences in the determination of loan pricing and covenant inclusion. While we place more emphasis on results that are robust across the covenant sub-samples, we also note the distinctions.

A comparison of intercepts across the "Cov" (loans containing a particular covenant) and "No Cov" (loans excluding a particular covenant) samples indicates that, for all covenants, the No Cov sample intercept is larger than that obtained in the Cov sample. That is to say the unexplained portion of the price, conditional on the covariates, is larger for loans not containing a covenant. This pattern across covenants is to be expected if there is an inverse relation between prices and covenants.

Firm size, as measured by market capitalization, is the most important general factor that determines yields. Save for the constants, the negative relation between size and yields for each sub-sample is the single most important set of numbers in the table. Large firms have assets that can be used to collateralize their debt obligations. The significant effect of size across all of the sub-samples gives us confidence to conclude that larger firms pay less for the debt they issue, consistent with the CCH. The positive sign and significance of the coefficients on leverage (the amount of pre-existing debt)

[24] For brevity, we do not report the reduced form covenant choice estimates. In general, the estimates are similar to those of the covenant choice model reported in the next section.

indicate that this is an important factor in determining the promised yield on additional debt. Consistently across the sub-samples, the coefficient on leverage is positive and highly significant. Firms with higher amounts of existing debt pay more for additional debt, regardless of the covenants they include. Increasing the amount of debt increases the probability that the firm might fall into financial distress sometime in the future and, consistent with the CCH, the promised yield on the debt should increase.

Importantly, market-to-book is generally significant and always positive. High growth firms pay higher interest rates, which is consistent with the CCH, and differs from the negative relation between these two variables reported in Table III. In single variable relations, like Table III, market-to-book can proxy for a number of factors. Once risk, maturity, leverage and other factors are modeled, as they are in Table V, market-to-book and yield reveal the expected negative relation. Interestingly, this variable is insignificant almost exclusively in the no-covenant samples. Thus, it appears that rather than penalizing high growth firms by increasing interest rates, high growth firms, as we will see, are more likely to be subject to covenant restrictions.

Note that across the six equations, the relation between maturity and yield is predominately negative, which is inconsistent with the CCH. This relation is particularly negative in the No Cov samples. The CCH would predict a positive relation, particularly if the term spread is accounted for, which it is. It may be the case that very risky firms are confined to short-term debt, which generates a spurious relation between maturity and promised yield.

Syndicate size is positively related to yield, especially in the No Cov sub-samples. This implies that as the number of lenders increases, the promised yield is higher, suggesting that the number of lenders is a proxy for some unmeasured dimension of risk. We conjecture that syndicates are formed to reduce the risk to any one lender. An additional reason to form a syndicate of lenders is because the issue is too large for any one lender to handle. However, this is just another manifestation of the risk of the loan and something that we control for in the model (*Loan Amount / Book Assets*). Clearly if the loan were risk-free there would be no difficulty in one lender supplying all of the financing. The lender could secure an unlimited amount of risk-free loans simply by holding or shorting treasury bills.

The data indicate that the relative amount of fixed assets and profitability decrease the promised yield as well. The effect of regulation is generally insignificant, with the exception of dividend restrictions. This result is unsurprising given the safety net regulatory environments provide and the high dividend yields typically paid by most regulated firms. Perhaps with all of the other parameters specified, whether or not the firm is in a regulated industry provides no additional information regarding the promised yield on the debt.

Table V shows that supply-side factors (type of lending institution) affect the pricing of private corporate debt as well. None of the relations between yield and commercial banks are significant. However, yields are significantly higher when the debt is held by investment banks (SIC 6211). This result is consistent with that of Denis and Mihov (2003) who find that non-bank private lenders attract the riskiest borrowers among public and private debt issuers.

Finally, macroeconomic factors are also important for loan pricing in a manner consistent with the CCH. The fact that credit spread, which is the difference in the yield on BAA and AAA corporate bonds, is significantly positive across all 12 regressions indicates that market-wide default-risk is reflected in corporate bond yields. The term spread is negatively related to the yield. We would expect this relation to be positive. A higher term spread should be associated with a higher promised yield, especially for longer maturity bonds. We find that the yields on all of the debt instruments in our sample that were issued over the 2000-2001 period (a period of record losses in the equity market) are significantly higher than debt issued in the other periods. We interpret this "premium" as compensation for the risk associated with an anticipated recession.

We close our discussion of the loan pricing results by noting a general relation between the estimated parameters in the Cov and No Cov samples for all covenants. The parameter estimates in the No Cov samples tend to be larger in magnitude than those in the Cov sample. Intuitively, loan prices among loans that exclude a particular covenant tend to be more sensitive to the various risk factors, than those containing a covenant. For example, the coefficient on market capitalization is uniformly larger in magnitude (i.e. more negative) in the No Cov samples. Thus, as firm size decreases, the loan price tends to increase but it increases more so in loans that do not contain a covenant. Similarly, the market-to-book ratio exhibits an identical pattern; high growth firms are all charged a higher price, however this price increase is larger if their loan excludes a particular covenant. This heightened price sensitivity in the absence of a covenant is also consistent with the CCH.

5.2 Covenant Inclusion Results

We are now prepared to test the major prediction of the CCH, which is a negative relation between promised yields and the presence of bond covenants. Borrowers should be rewarded for accepting the constraints imposed by bond covenants through a lower yield. Otherwise, the whole notion of the CCH is brought into question.

Table VI presents the results of our covenant inclusion probit analysis. There is one equation for each of the six types of bond covenants under study. In each, the dependent variable is 1 if the bond contains the indicated covenant and zero otherwise. Since the probit function is nonlinear, the estimated coefficient does not represent the marginal impact of the covariate on the probability of including a covenant. For our probit specification, this measure is given by:

$$\frac{\partial E\left[I\left(Cov^{*}>0\right)\right]}{\partial \theta}=\phi\left(\theta' X\right)\theta, \tag{10}$$

where ϕ is the standard normal density function and $\theta = (\alpha, \delta, \Gamma)$. Since the marginal effect is a function of the vector of independent variables, we must select a value for these variables in order to evaluate the derivative. A natural choice is the unconditional mean, which is what we use to compute the slopes presented in Table VI.[25] Thus, the slope estimates presented in Table VI relate the marginal effect of a one-unit change from the mean value of a given covariate on the probability of including the indicated covenant. For example, a one-unit increase in the log of market capitalization results in a 12% decrease in the probability of including a dividend restriction.

The most important statistics for our purposes are those for the second variable in the table, $log(Price_{No\,Cov}) - log(Price_{Cov})$. This variable is the difference in the log of the predicted yield for the bond if it did not include the indicated covenant and the log of the

[25] We also evaluate the slopes using the vector of medians, with little change in the results.

predicted yield if it did– the difference in the predictions of equations (8) and (9). Intuitively, this difference measures the expected percentage price decrease associated with including a covenant. If bond covenants are priced, then we should observe a positive coefficient on this variable. That is, as the expected price decline associated with the inclusion of a covenant increases, the likelihood of including a covenant should increase. The relation between the presence of a covenant and this difference is positive and significant for four of the six covenant categories. The only perverse relation is for the Equity Sweeps. Further, the impact of the price differential is economically large, particularly so for financial covenants, and asset and debt sweeps. A 1% increase in the expected price discount results in a 50% (160%) [45%] increase in the likelihood of including more than two financial ratio restrictions (asset sweep) [debt sweep]. In general, the presence of a covenant is associated with a lower promised yield. These results indicate that covenants are indeed priced, and that they are priced according to the prediction of the CCH.

Our tests have focused on the relation between the inclusion of a particular covenant and the resulting yield. We have not expanded our analysis to include the examination of the effects of combinations of covenants on bond yields. However, since we find that most of the relations between covenants and yield have the same sign, we expect that combinations of covenants will also be negatively related to yield. In other words, we do not expect to see the effects of more than one covenant in a bond agreement canceling each other out.

The data in Table VI provide additional evidence consistent with the CCH, while also illustrating a general distinction between sweep provisions and the other covenants. Again we see the effects of size. Large market cap firms are less likely to include dividend restrictions, security provisions or equity sweeps in their bond agreements. Interestingly though, we see that large firms are more likely to include an asset sweep. Assuming that larger firms have more assets available for disposal and are, thus, more likely to engage in asset sales that decrease the value of their outstanding debt, restricting their ability to do so is consistent with the CCH. Firms with tangible assets and regulated firms are less likely to include bond covenants. As expected, high leverage firms are more likely to include all types of covenants. High growth (high market-to-book ratio) firms are also more likely to include a dividend restriction, security requirement or a financial covenant in their loan contracts. Interestingly though, these firms are *less* likely to include either an asset or debt sweep covenant, suggesting that access to external funds supersedes the attendant agency costs associated with the activities these covenants are meant to restrict.

By and large maturity and the presence of covenants are positively related. Long-term debt has more covenants than short-term debt. This finding is consistent with our interpretation of the negative relation between covenants and yield reported in the previous section. There we argued that this negative relation was the result of high-risk firms being priced out of the long-term market. Thus, short-term debt with no covenants and long-term debt with covenants are substitutes. Consistent with this interpretation, the data in Table VI reveal a predominately positive relation between the inclusion of a covenant and maturity.

Supply side factors enter into the contract structure, as well as the pricing of the debt. To the extent the syndicate size is a proxy for risk, as discussed above, the mostly positive relations that we observe are also to be expected. Investment banks, which Denis and Mihov (2003) note attract the riskiest set of borrowers, are significantly more likely to include covenant restrictions, with the exception of dividend restrictions and debt sweeps that are only marginally significant. National commercial banks are more likely to include a dividend restriction in their loan contracts, which is perhaps a reflection of sample selection: dividend paying firms, for which such a restriction is relevant, are more likely to obtain lending from national commercial banks.

Macroeconomic factors are also relevant for covenant inclusion in a manner consistent with the predictions of the CCH. Credit spreads exhibit a significantly positive association with the inclusion of all covenants but for dividend restrictions, which are statistically insignificant. During the depressed equity market over the period 2000-2001, the likelihood of securing debt, restricting financial ratios or including security sweeps increased significantly. Each of these associations reflect the notion that during periods of greater financial distress, agency costs tend to be greater and firms mitigate this problem through the use of more restrictive contracts.

Finally, note the reasonably high predictive accuracy of our covenant-inclusion regressions. Roughly speaking, the models correctly predict the inclusion of a particular covenant 80% of the time. The percentage of correct predictions range from a low of 72% to a high of 84%.

7. Summary and Conclusions

The major objective of this paper is to answer the empirical question are covenants priced. Our empirical analysis clearly shows that, all else equal, the presence of a covenant reduces the promised yield of a debt agreement. This finding is consistent with the CCH in that there is a tradeoff between covenants and yield. Covenants are indeed priced by market participants.

We also find that loans to high-growth firms are more likely to include covenants that restrict dividends, require security or set financial ratio limits than loans made to non-growth firms. We show that the inclusion of a covenant varies systematically with macroeconomic factors as well as with supply-side factors, in a manner consistent with the predictions of the CCH Finally, we show that consistent with the CCH, firms that elect to issue private rather than public debt are smaller, more highly leveraged, and include more covenants in their debt agreements.

An important byproduct of our analysis is to demonstrate that the decision to include a covenant and the corresponding promised yield are determined simultaneously. Consequently, statistical models that ignore this simultaneity in analyzing the effects of covenants, like single-equation probit models, are misspecified and do not generate reliable statistics. In fact we suspect that our perverse negative sign between maturity and yields is a failure on our part to make maturity an endogenous variable. By modeling the maturity decision, we will be able to disassociate the risk-factors from the term-structure factors. However, we leave this task for another paper.

REFERENCES

Baker, M. and J. Wurgler, 2002, Market Timing and Capital Structure, *Journal of Finance*, 57: 1-32.

Barclay, M.J. and C. W. Smith, 1995a, The maturity structure of corporate debt, *Journal of Finance*, 50(2): 609-631.

Barclay, M.J. and C. W. Smith, 1995b, The priority structure of corporate liabilities, *Journal of Finance*, 50(3): 899-917.

Begley, J., 1994, Restrictive covenants included in public debt agreements: an empirical investigation, *Working Paper*, University of British Columbia.

Begley, J. and G. A. Feltham, 1999, An empirical examination of the relation between debt contracts and management incentives, *Journal of Accounting & Economics*, 27: 229-259.

Bradley, M., G. Jarrell and E. H. Kim, 1984, On the existence of an optimal capital structure: Theory and evidence, *Journal of Finance*, 39(3): 857-878.

Carey, Mark and Mark Hrycray, 1999, Credit flow, risk, and the role of private debt in capital structure, *Working paper*, Federal Reserve Board

Denis, D. J. and V. T. Mihov, 2004, The choice among bank debt, non-bank debt, non-bank private debt and public debt, forthcoming *Journal of Financial Economics*.

Dichev, I. D. and D. J. Skinner, 2002, Large-sample evidence on the debt covenant hypothesis, *Working Paper*

Coase, R., 1960, The problem of social cost, *Journal of Law and Economics*, 3: 1-44.

Frank, M. and V. Goyal, Testing the pecking order theory of capital structure, *Journal of Financial Economics*, 67:217-248.

Goyal, V. K., 2001, Market discipline of bank risk: evidence from subordinated debt contracts, *Working Paper*, Department of Finance, Hong Kong University of Science & Technology.

Graham, J. R., 2003, Taxes and corporate finance: A review, *Review of Financial Studies*, 16(4): 1075-1129

Harris, M. and A. Raviv, 1991, The theory of capital structure, *Journal of Finance*, 46(1): 297-355

Houston, J. and C. James, 1996, Bank Information Monopolies and Mix of Private and Public Debt Claims, *Journal of Finance*, 51(5): 1863-1889

Hubbard, R. G., K. N. Kuttner and D. N. Palia, 2002, Are there bank effects in borrowers' costs of funds? Evidence from a matched sample of borrowers and banks, *Journal of Business*, 75(4): 559-581.

Jensen, M.C. and W.H. Meckling, 1976, Theory of the firm: managerial behavior, agency costs, and capital structure, *Journal of Financial Economics*, 3:305-360.

Kahan, M. and D. Yermack, Investment opportunities and the design of debt securities, *Journal of Economics and Organization*, 14(1): 136-153.

Leary, M. and M. R. Roberts, 2003, Do firms rebalance their capital structures?, *Working Paper,* Duke University.

Malitz, I., 1986, On financial contracting: the determinants of bond covenants, *Financial Management*, Summer, 18-25

Myers, S. C., 1977, Determinants of corporate borrowing, *Journal of Financial Economics* 5:147-145.

Nash, C. R., J. M. Netter and A. B. Poulsen, 2003, Determinants of contractual relations between shareholders and bondholders: investment opportunities and restrictive covenants, *Journal of Corporate Finance*, 9: 201-232.

Smith, C. W. and J. B. Warner, 1979, On financial contracting: An Analysis of Bond Covenants, *Journal of Financial Economics* 7(2): 117-161.

Figure 1
Public and Private Debt Markets

The figure presents a comparison of U.S. dollar denominated public and private debt. The public debt data come from SDC and include all convertible and nonconvertible debt issues from nonfarm, nonfinancial issuers (1-digit SIC codes beginning with 0 or 6) located in the U.S. The private loan data come from an August 2002 extract of the Dealscan database marketed by Loan Pricing Corporation (LPC) and consist of U.S. dollar denominated loans to nonfarm, nonfinancial U.S. corporate borrowers. The bars represent the total face value of all public debt issuances (Aggregate Public) and private loans (Aggregate Private) in a given year. The line plots represent the average face value all public debt issuances (Average Public) and private loans (Average Private) in a given year.

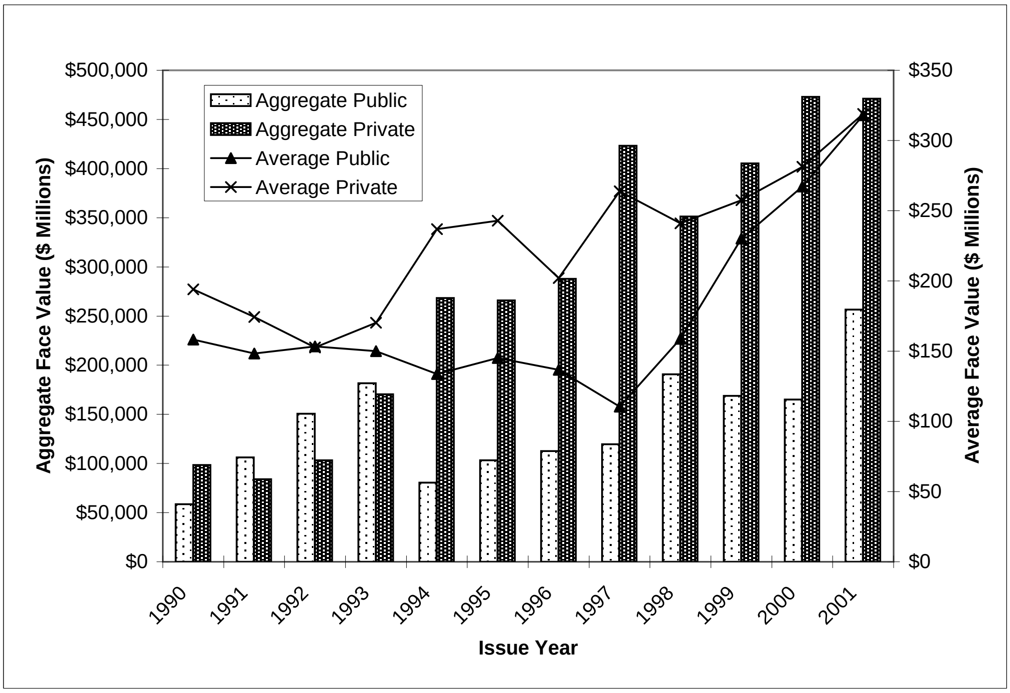

Table I

Summary Statistics for Private Loans During 1990-2001

The sample consists of all U.S. nonfarm, nonfinancial corporations with U.S. dollar-denominated loans starting between 1990 and 2001, and containing information on the loan amount, maturity and promised yield. Packages consist of one or more loans struck at the same point in time. Percentages represent the fraction of the sample with the corresponding characteristic. For example, 67.85% of the sample loans in 1990 are revolving and 76.36% of the sample loans in 1995 are secured. The Promised Yield is the average spread above the 6-month LIBOR. Maturity is the average loan term. # of Restricted Acct. Ratios is the average number of accounting ratios per loan that are restricted to lie above or below a specific threshold.

Variable	All Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Sample Composition													
# of Loans	14,112	507	482	677	1,000	1,133	1,095	1,424	1,604	1,457	1,574	1,682	1,477
# of Packages	9,826	386	374	513	731	777	743	985	1,112	966	1,025	1,163	1,051
# of Companies	8,492	316	300	418	626	686	668	846	952	851	921	1,003	905
Loan Type													
364-Day Loan	10.68%	1.38%	1.45%	1.03%	5.20%	7.94%	6.85%	5.27%	7.29%	11.53%	13.91%	20.81%	23.02%
Term Loan	23.76%	24.85%	20.95%	24.08%	22.60%	23.04%	22.28%	22.89%	24.00%	27.18%	28.21%	22.77%	20.18%
Revolving Loan	60.49%	67.85%	65.56%	69.72%	66.50%	64.61%	66.30%	69.03%	65.34%	58.27%	52.16%	49.82%	50.30%
Deal Purpose													
Corp. Purposes	22.05%	27.22%	34.23%	37.96%	33.60%	35.75%	29.32%	20.65%	16.21%	12.97%	11.75%	15.87%	19.91%
Debt Repayment	31.14%	24.06%	24.27%	22.16%	19.50%	17.65%	34.06%	45.65%	41.08%	35.90%	30.43%	33.71%	24.31%
Takeover	14.39%	12.43%	5.60%	3.99%	4.40%	13.33%	15.16%	13.83%	20.32%	25.33%	22.30%	12.43%	6.84%
Working Capital	11.66%	25.44%	20.95%	21.27%	21.40%	13.77%	7.85%	5.97%	6.30%	6.31%	8.39%	8.68%	17.60%
Loan Details													
Promised Yield (basis points)	195.14	198.84	227.78	227.53	217.04	180.49	175.28	186.82	165.19	181.28	214.69	203.13	203.84
Loan Amount ($ Mil.)	$241.07	$193.94	$174.42	$152.67	$170.28	$236.94	$242.85	$202.06	$263.84	$241.05	$257.54	$281.23	$318.92
Maturity (Months)	43.60	48.48	39.94	42.62	40.52	45.67	47.14	47.11	47.51	46.48	44.00	39.91	34.74
Performance Pricing	38.78%	1.18%	0.41%	0.59%	4.10%	27.10%	48.40%	50.00%	52.74%	56.90%	51.97%	43.40%	43.87%
Covenant Details													
# of Restricted Acct. Ratios	2.52	.	.	.	2.13	2.04	2.24	2.39	2.35	2.53	2.86	2.65	2.52
Secured Loan	77.57%	.	.	.	83.97%	75.47%	76.36%	75.26%	74.88%	82.19%	77.68%	73.00%	72.26%
Dividend Restricted	85.14%	.	.	.	82.22%	76.55%	84.88%	86.68%	89.58%	88.24%	86.03%	81.24%	81.10%
Minimum Net Worth	25.76%	.	.	.	1.20%	5.74%	28.77%	44.66%	42.02%	38.85%	32.40%	27.53%	25.80%
Asset Sweep	62.51%	.	.	.	32.10%	48.75%	40.62%	44.01%	51.97%	70.16%	85.04%	91.14%	93.80%
Debt Sweep	46.23%	.	.	.	18.01%	32.88%	23.50%	26.77%	39.89%	53.37%	68.94%	71.08%	80.67%
Equity Sweep	45.92%	.	.	.	24.84%	34.84%	25.43%	28.52%	37.93%	53.00%	67.75%	69.31%	75.49%

Table II
Firm Characteristics

The table presents summary statistics of firm characteristics. Panel A presents summary statistics for the matched Dealscan and COMPUSTAT sample. Panel B presents summary statistics for public debt issuers in SDC with corresponding COMPUSTAT data. Each sample is restricted to nonfarm, nonfinancial U.S. corporations borrowing U.S. dollars during the 1990-2001 period. *Sales* is the gross sales in millions of dollars. *Total Assets* is the total assets in millions of dollars. *Market Cap.* is the market value of equity in millions of dollars. *Market-to-Book* is the ratio of book assets minus book equity plus market equity to book assets. *Z-Score* is (3.3 $\times$ pre-tax income / total assets + 0.999 $\times$ sales / total assets + 1.4 $\times$ retained earnings / total assets + 1.2 $\times$ working capital / total assets + 0.6 $\times$ equity / debt). *Market Leverage* is the ratio of total debt to the sum of total debt and the market value of equity. *Book Leverage* is the ratio of total debt to total assets. *Tangibility* is the ratio of physical plant, property, and equipment to total assets. *EBITDA/Book Assets* is the ratio of EBITDA to total assets. *LT Debt/Total Debt* is the ratio of long term debt to total debt. *RnD / Book Assets* is the ratio of research and development expenditures to total assets. The following adjustments are made to both samples: *Market Leverage, PPE/Book Assets, RnD/Book Assets* and *LT Debt/Total Debt* are restricted to the unit interval, market-to-book ratio is required to lie between 0 and 20, and Fixed Asset Life is required to lie between 0 and 10,000. All dollar values are inflation adjusted to December 2000 dollars using the All-Urban CPI.

Panel A: Matched Dealscan/COMPUSTAT Sample

Variable	N	Mean	Median	SD	Min	Max
Sales	6,928	\$587	\$112	\$1,717	\$0	\$47,050
Total Assets	6,726	\$2,414	\$372	\$8,067	\$0	\$252,352
Market Cap.	6,273	\$2,782	\$332	\$11,503	\$0	\$287,356
Market-to-Book	6,228	1.81	1.40	1.39	0.33	18.29
Z-Score	5,505	3.07	1.86	5.46	-42.37	48.93
Market Leverage	5,977	30.04%	25.51%	24.23%	0.00%	100.0%
Book Leverage	6,331	30.10%	29.53%	20.22%	0.00%	99.81%
PPE / Book Assets	6,693	33.81%	27.74%	24.08%	0.00%	96.76%
EBITDA / Book Assets	5,425	4.18%	3.63%	3.12%	0.00%	85.21%
LT Debt / Total Debt	6,109	74.23%	87.30%	30.38%	0.00%	100.0%
RnD / Book Assets	2,384	1.70%	0.59%	2.94%	0.00%	47.34%

Panel B: SDC Public Issuers

Variable	N	Mean	Median	SD	Min	Max
Sales	5,833	$3,151	$1,159	$5,715	$0	$63,228
Total Assets	5,814	$15,432	$6,691	$29,545	$3	$310,025
Market Cap.	5,230	$15,101	$4,543	$29,285	$4	$263,003
Market-to-Book	5,172	1.73	1.42	0.91	0.59	13.13
Z-Score	4,441	1.74	1.50	1.72	-2.57	43.59
Market Leverage	4,846	33.66%	30.94%	18.94%	0.00%	97.50%
Book Leverage	5,145	37.08%	35.63%	14.82%	0.00%	99.56%
PPE/Book Assets	5,797	46.50%	44.34%	25.21%	0.22%	96.12%
EBITDA / Book Assets	5,142	3.73%	3.43%	1.92%	0.00%	26.48%
LT Debt / Total Debt	5,179	81.93%	87.53%	17.76%	0.00%	100.0%
RnD / Book Assets	1,403	1.17%	0.74%	1.50%	0.00%	16.53%

Table III

Correlation Matrix

The sample consists of all U.S. nonfarm, nonfinancial corporations with U.S. dollar-denominated loans starting between 1990 and 2001, and containing information on the loan amount, maturity and promised yield. The table presents Pearson correlation coefficients. P-values (in parentheses) are from a two-tailed test of significance. Values of "0.00" imply a P-Value less than 0.005. *Promised Yield* is the spread above the 6-month LIBOR charged on each dollar drawn. *Maturity* is the term of the loan. *Market-to-Book* is the ratio of book assets minus book equity plus market equity to book assets. *Secured* is a binary variable equal to one if the loan is secured. *Divdend Restricted* is a binary variable equal to one if the loan contains a dividend restriction. > 2 *Restricted Acct. Ratios* is a binary variable equal to one if the loan restricts more than two accounting ratios (e.g. interest coverage, current ratio, etc.). *Asset* (*Debt, Equity*) *Sweep* is a binary variable equal to one if the loan contains an asset (debt, equity) sweep covenant. *Min. Net Worth* is a binary variable equal to one if the loan contains a restriction on the minimum net worth of the company.

	Promised Yield	Maturity	log of Market Cap.	Market-to-Book	Secured	Dividend Restricted	> 2 Restricted Acct. Ratios	Asset Sweep	Debt Sweep	Equity Sweep	Min. Net Worth
Promised Yield	1.00	0.02	-0.62	-0.17	0.53	0.34	0.24	0.42	0.33	0.38	0.02
	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)
Maturity	0.02	1.00	-0.01	-0.01	0.12	0.13	0.25	0.28	0.25	0.19	-0.04
	(0.00)	(.)	(0.27)	(0.19)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Market Cap.	-0.62	-0.01	1.00	0.35	-0.47	-0.34	-0.15	-0.16	-0.03	-0.15	-0.13
	(0.00)	(0.27)	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
Market-to-Book	-0.17	-0.01	0.35	1.00	-0.11	-0.05	-0.03	-0.11	-0.06	-0.09	-0.02
	(0.00)	(0.19)	(0.00)	(.)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.07)
Secured	0.53	0.12	-0.47	-0.11	1.00	0.44	0.32	0.41	0.30	0.32	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.28)
Dividend Restricted	0.34	0.13	-0.34	-0.05	0.44	1.00	0.25	0.27	0.20	0.20	0.12
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(.)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
> 2 Restricted Acct. Ratios	0.24	0.25	-0.15	-0.03	0.32	0.25	1.00	0.34	0.32	0.34	-0.07
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(.)	(0.00)	(0.00)	(0.00)	(0.00)
Asset Sweep	0.42	0.28	-0.16	-0.11	0.41	0.27	0.34	1.00	0.62	0.60	-0.14
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(.)	(0.00)	(0.00)	(0.00)
Debt Sweep	0.33	0.25	-0.03	-0.06	0.30	0.20	0.32	0.62	1.00	0.68	-0.11
	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(.)	(0.00)	(0.00)
Equity Sweep	0.38	0.19	-0.15	-0.09	0.32	0.20	0.34	0.60	0.68	1.00	-0.08
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(.)	(0.00)
Min. Net Worth	0.02	-0.04	-0.13	-0.02	0.01	0.12	-0.07	-0.14	-0.11	-0.08	1.00
	(0.04)	(0.00)	(0.00)	(0.07)	(0.28)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(.)

Table IV
Loan Covenants by Loan Portfolios

The sample consists of all U.S. nonfarm, nonfinancial corporations with U.S. dollar-denominated loans starting between 1990 and 2001, and containing information on the loan amount, maturity and promised yield. The sample is independently sorted into quintiles each year based on Size (market capitalization), market-to-book (ratio of book assets minus book equity plus market equity to book assets), and all-in-drawn spread (the promised yield of the loan above 6-month LIBOR). The market capitalization and market-to-book value are measured in the quarter preceding the start of the loan. The table presents the fraction of loans in each size/market-to-book or size/all-in-drawn spread bin that are secured, contain a dividend restriction, have more than two accounting ratios restricted, or contain an asset sweep, equity sweep, debt sweep or net worth covenant.

	Market-to-Book					All-in-Drawn Spread				
Size	Low	2	3	4	High	Low	2	3	4	High
					Secured Debt					
Small	0.98	0.97	0.94	0.97	0.97	1.00	0.88	0.95	0.97	0.99
2	0.88	0.89	0.88	0.88	0.89	0.51	0.73	0.92	0.95	0.99
3	0.78	0.76	0.78	0.82	0.82	0.39	0.72	0.93	0.96	0.95
4	0.68	0.68	0.72	0.67	0.72	0.36	0.71	0.96	0.93	0.96
Big	0.43	0.43	0.31	0.37	0.43	0.17	0.67	0.90	0.93	0.85
					Dividend Restriction					
Small	0.94	0.97	0.97	0.89	0.99	1.00	0.93	0.96	0.95	0.95
2	0.93	0.92	0.90	0.95	0.96	0.76	0.91	0.93	0.94	0.97
3	0.86	0.87	0.93	0.92	0.90	0.74	0.87	0.92	0.98	0.95
4	0.87	0.77	0.82	0.83	0.90	0.64	0.87	0.97	0.97	0.95
Big	0.57	0.51	0.49	0.63	0.60	0.42	0.78	0.92	0.89	0.97
					>2 Restricted Accounting Ratios					
Small	0.45	0.42	0.53	0.31	0.29	0.80	0.48	0.44	0.45	0.38
2	0.46	0.64	0.60	0.49	0.43	0.48	0.46	0.55	0.59	0.50
3	0.48	0.46	0.52	0.61	0.50	0.32	0.44	0.55	0.61	0.72
4	0.33	0.39	0.47	0.39	0.53	0.17	0.43	0.60	0.67	0.78
Big	0.23	0.19	0.13	0.18	0.28	0.08	0.27	0.49	0.60	0.63

	Market-to-Book					All-in-Drawn Spread				
Size	Low	2	3	4	High	Low	2	3	4	High
					Asset Sweep					
Small	0.55	0.62	0.73	0.53	0.53	0.50	0.44	0.56	0.59	0.65
2	0.57	0.73	0.61	0.69	0.49	0.60	0.55	0.53	0.71	0.75
3	0.56	0.63	0.68	0.52	0.57	0.37	0.45	0.64	0.85	0.87
4	0.45	0.65	0.65	0.51	0.59	0.36	0.52	0.69	0.89	0.89
Big	0.26	0.44	0.44	0.46	0.42	0.25	0.53	0.68	0.97	0.88
					Debt Sweep					
Small	0.28	0.36	0.44	0.23	0.33	0.50	0.26	0.29	0.36	0.32
2	0.43	0.59	0.47	0.40	0.21	0.38	0.36	0.35	0.50	0.66
3	0.37	0.45	0.54	0.40	0.42	0.22	0.26	0.46	0.76	0.67
4	0.43	0.58	0.46	0.41	0.50	0.28	0.36	0.59	0.80	0.79
Big	0.15	0.34	0.44	0.36	0.30	0.22	0.37	0.52	0.68	0.77
					Equity Sweep					
Small	0.34	0.43	0.57	0.37	0.57	0.50	0.27	0.38	0.46	0.43
2	0.43	0.52	0.53	0.55	0.30	0.29	0.42	0.35	0.53	0.75
3	0.34	0.46	0.43	0.39	0.44	0.25	0.28	0.35	0.68	0.67
4	0.38	0.46	0.37	0.29	0.46	0.20	0.34	0.49	0.66	0.63
Big	0.08	0.39	0.29	0.29	0.21	0.18	0.27	0.41	0.59	0.66
					Minimum Net Worth					
Small	0.38	0.37	0.29	0.27	0.24	0.17	0.34	0.39	0.36	0.31
2	0.36	0.30	0.36	0.36	0.31	0.21	0.39	0.40	0.32	0.27
3	0.23	0.33	0.34	0.31	0.32	0.27	0.35	0.34	0.25	0.23
4	0.20	0.21	0.23	0.25	0.26	0.16	0.28	0.29	0.22	0.13
Big	0.14	0.12	0.14	0.15	0.14	0.11	0.18	0.23	0.09	0.25

Table V
Loan Price Regressions

The sample consists of all U.S. nonfarm, nonfinancial corporations with U.S. dollar-denominated loans starting between 1990 and 2001, and containing information on the loan amount, maturity and promised yield. The table presents estimated coefficients (and cluster adjusted t-statistics in parentheses) from regressions of the logarithm of the promised yield on the loan (measured in basis points above the 6-month LIBOR). Each column corresponds to different subsamples conditioned on the inclusion (*Cov*) or omission (*No Cov*) of a particular covenant. The sample selection is corrected for by including the appropriate inverse mills ratio (*IMR*) computed in a first stage reduced form probit model. The economic covariates include: *Log(Maturity)* is the log of maturity measured in months; *Loan Amount / Book Assets* is the ratio of loan size to total assets; *Book Leverage* is the ratio of total debt to total assets; *Log(Market Cap.)* is the log of market capitalization; *Log(Market-to-Book)* is the log of the ratio book assets minus book equity plus market equity to book assets; *PPE / Book Assets* is the ratio of physical plant, property, and equipment to total assets; *EBITDA / Book Assets* is the ratio of EBITDA to total assets; *Regulated* is a binary variable indicating that the borrower is a regulated firm (SIC in 4900-4999); *Syndicate Size* is the number of banks in the lending syndicate; *National Comm. Bank, State Comm. Bank, Comm. Bank n.e.c*, and *Security Broker/Dealer* are binary variables equal to one if the lead bank, arranger or credit agent's 4-digit SIC code is 6021, 6022, 6029 or 6211, respectively; *Term Spread* is the difference in the 10-year and 1-year treasury bonds; *Credit Spread* is the difference in the yields on BAA and AAA corporate bonds; $I(1990 \leq Year \leq 1994)$ and $I(2000 \leq Year \leq 2002)$ are binary variables equal to one if the initiation year of the loan is between 1990 and 1994 and 2000-2001, respectively. Also included in the regression but not reported are binary variables for 1-digit SIC code, deal purpose, loan type and whether the loan is performance priced.

Panel A: Dividend Restricted/Secured/Financial Ratio

	Dividend Restriction		Secured		Financial Covenant	
Variable	Cov	No Cov	Cov	No Cov	Cov	No Cov
Intercept	6.20	6.40	6.19	6.87	5.75	7.01
	(42.53)	(17.90)	(51.12)	(26.67)	(28.20)	(34.43)
IMR	0.03	0.01	0.00	-0.01	0.00	-0.08
	(1.40)	(1.15)	(1.97)	(-1.49)	(0.63)	(-3.60)
Log(Maturity)	-0.06	-0.11	-0.05	-0.16	0.01	-0.08
	(-2.24)	(-1.58)	(-2.63)	(-3.68)	(0.36)	(-2.51)
Loan Amount / Assets	-0.08	-0.22	-0.12	-0.02	-0.18	-0.23
	(-2.71)	(-1.70)	(-2.62)	(-0.87)	(-3.02)	(-3.54)
Book Leverage	0.51	0.46	0.43	0.51	0.45	0.60
	(7.05)	(2.63)	(6.97)	(3.90)	(5.35)	(6.73)
Log(Market Cap.)	-0.20	-0.32	-0.15	-0.29	-0.13	-0.32
	(-11.73)	(-9.41)	(-11.90)	(-15.45)	(-6.83)	(-17.16)
Log(Market-to-Book)	0.07	0.14	0.07	0.14	0.02	0.18
	(1.74)	(1.46)	(2.17)	(2.27)	(0.36)	(3.26)
PPE / Assets	-0.16	-0.17	-0.04	-0.42	-0.11	-0.23
	(-2.65)	(-1.24)	(-0.69)	(-4.86)	(-1.58)	(-2.83)
EBITDA / Assets	-2.47	-2.60	-1.72	-0.49	-2.42	-1.94
	(-4.18)	(-2.54)	(-3.35)	(-0.66)	(-2.53)	(-3.22)
Regulated	-0.19	-0.28	-0.13	-0.22	0.05	-0.16
	(-2.20)	(-2.41)	(-2.03)	(-1.75)	(0.48)	(-1.67)
Syndicate Size	0.01	0.02	0.00	0.02	-0.00	0.03
	(2.04)	(2.66)	(0.84)	(2.90)	(-0.15)	(4.86)
National Comm. Bank	-0.02	0.07	-0.01	0.03	-0.01	0.03
	(-0.82)	(1.32)	(-0.46)	(0.72)	(-0.31)	(0.79)
State Comm. Bank	-0.02	0.30	-0.01	0.07	0.04	-0.11
	(-0.28)	(1.22)	(-0.16)	(0.41)	(0.54)	(-1.12)
Comm. Bank n.e.c.	0.11	0.20	0.05	0.12	0.13	0.11
	(3.21)	(3.01)	(1.69)	(2.66)	(3.74)	(2.27)
Investment Bank	0.27	0.27	0.22	0.19	0.20	0.29
	(5.74)	(2.66)	(5.79)	(2.17)	(4.46)	(3.88)
Term Spread	-0.06	-0.07	0.02	-0.07	-0.04	-0.07
	(-3.06)	(-1.98)	(0.88)	(-2.30)	(-1.57)	(-2.82)
Credit Spread	0.79	0.99	0.26	0.66	0.62	0.66
	(8.92)	(4.85)	(3.38)	(4.07)	(5.82)	(5.12)
$I(1990 \leq Year \leq 1994)$	-0.01	0.14	-0.09	0.12	0.04	0.13
	(-0.17)	(1.61)	(-2.43)	(1.83)	(0.32)	(1.33)
$I(2000 \leq Year \leq 2001)$	0.24	0.23	0.19	0.26	0.23	0.20
	(8.29)	(3.47)	(6.54)	(5.38)	(7.39)	(5.45)
Adj. R^2	0.51	0.52	0.36	0.47	0.42	0.58
Obs	2,292	546	2,140	1,049	1,085	1,445

Panel B: Asset Sweep/Debt Sweep/Equity Sweep

	Asset Sweep		Debt Sweep		Equity Sweep	
Variable	Cov	No Cov	Cov	No Cov	Cov	No Cov
Intercept	5.92	7.53	5.77	7.16	5.72	6.88
	(29.82)	(25.77)	(26.19)	(27.63)	(25.84)	(29.61)
IMR	-0.00	-0.00	-0.00	-0.04	0.01	-0.01
	(-0.42)	(-0.51)	(-1.93)	(-1.53)	(1.97)	(-0.76)
Log(Maturity)	0.04	-0.28	0.08	-0.15	0.07	-0.15
	(1.14)	(-5.44)	(1.95)	(-3.98)	(1.75)	(-3.31)
Loan Amount / Assets	-0.22	-0.16	-0.24	-0.23	-0.13	-0.30
	(-3.38)	(-1.62)	(-3.11)	(-3.43)	(-1.70)	(-4.64)
Book Leverage	0.44	0.50	0.36	0.67	0.36	0.68
	(5.02)	(3.88)	(3.58)	(6.17)	(3.71)	(6.50)
Log(Market Cap.)	-0.15	-0.36	-0.15	-0.35	-0.12	-0.35
	(-7.03)	(-13.49)	(-7.64)	(-13.03)	(-5.19)	(-15.76)
Log(Market-to-Book)	0.02	0.25	0.00	0.32	0.02	0.30
	(0.32)	(3.34)	(0.06)	(5.06)	(0.37)	(4.61)
PPE / Assets	-0.01	-0.09	-0.10	-0.08	-0.04	-0.03
	(-0.14)	(-0.88)	(-1.11)	(-0.92)	(-0.43)	(-0.37)
EBITDA / Assets	-1.62	-1.50	-0.94	-2.65	-0.91	-2.26
	(-1.63)	(-2.22)	(-0.86)	(-3.90)	(-0.88)	(-3.38)
Regulated	-0.09	-0.02	-0.16	-0.05	-0.18	-0.08
	(-1.03)	(-0.15)	(-1.48)	(-0.42)	(-1.63)	(-0.79)
Syndicate Size	-0.01	0.03	-0.00	0.02	-0.01	0.03
	(-1.29)	(3.46)	(-0.45)	(3.40)	(-1.40)	(5.24)
National Comm. Bank	0.03	-0.04	0.09	-0.04	0.05	-0.03
	(0.97)	(-1.10)	(2.18)	(-1.27)	(1.40)	(-0.98)
State Comm. Bank	-0.02	0.00	-0.01	-0.04	-0.06	0.06
	(-0.30)	(0.02)	(-0.05)	(-0.30)	(-0.54)	(0.45)
Comm. Bank n.e.c.	0.07	0.17	0.12	0.13	0.07	0.11
	(1.98)	(2.54)	(3.02)	(2.30)	(1.70)	(2.09)
Investment Bank	0.21	0.16	0.17	0.48	0.14	0.33
	(4.44)	(1.21)	(3.49)	(4.36)	(2.65)	(3.83)
Term Spread	-0.03	-0.09	-0.07	-0.06	-0.03	-0.08
	(-1.27)	(-1.65)	(-2.29)	(-1.46)	(-1.00)	(-2.20)
Credit Spread	0.61	0.57	0.70	0.59	0.48	0.63
	(5.78)	(2.79)	(5.27)	(3.62)	(3.60)	(3.79)
$I(1990 \leq Year \leq 1994)$	0.06	0.11	-0.03	0.11	-0.00	0.08
	(0.90)	(1.24)	(-0.27)	(1.44)	(-0.00)	(1.08)
$I(2000 \leq Year \leq 2001)$	0.18	0.49	0.15	0.40	0.09	0.50
	(4.81)	(3.41)	(3.27)	(5.41)	(1.80)	(6.81)
Adj. R^2	0.47	0.58	0.44	0.61	0.41	0.61
Obs	1,146	846	823	1,119	786	1,162

Table VI
Covenant Inclusion Probit Regressions

The sample consists of all U.S. nonfarm, nonfinancial corporations with U.S. dollar-denominated loans starting between 1990 and 2001, and containing information on the loan amount, maturity and promised yield. Results from probit regressions of covenant inclusion (dividend restriction, secured, accounting ratios, asset sweep, debt sweep or equity sweep) are presented. Since the probit regression function is nonlinear, the table presents estimates of the marginal impact of each coefficient (i.e. slope), evaluated at the mean of the covariates, on the probability of including a covenant, as opposed to the coefficients themselves. Cluster-adjusted t-statistics that account for the dependence among loans to the same firm are presented in parentheses. The covariates include: *log(Price$_{Cov}$) - log(Price$_{NoCov}$)* is the expected log price differential between loans with and without a particular covenant. This value is estimated from the loan price regressions. *Log(Maturity)* is the log of maturity measured in months; *Loan Amount / Book Assets* is the ratio of loan size to total assets; *Book Leverage* is the ratio of total debt to total assets; *Log(Market Cap.)* is the log of market capitalization; *Log(Market-to-Book)* is the log of the ratio book assets minus book equity plus market equity to book assets; *PPE / Book Assets* is the ratio of physical plant, property, and equipment to total assets; *EBITDA / Book Assets* is the ratio of EBITDA to total assets; *Regulated* is a binary variable indicating that the borrower is a regulated firm (SIC in 4900-4999); *Syndicate Size* is the number of banks in the lending syndicate; *National Comm. Bank, State Comm. Bank, Comm. Bank n.e.c*, and *Security Broker/Dealer* are binary variables equal to one if the lead bank, arranger or credit agent's 4-digit SIC code is 6021, 6022, 6029 or 6211, respectively; *Term Spread* is the difference in the 10-year and 1-year treasury bonds; *Credit Spread* is the difference in the yields on BAA and AAA corporate bonds; $I(1990 \leq Year \leq 1994)$ and $I(2000 \leq Year \leq 2002)$ are binary variables equal to one if the initiation year of the loan is between 1990 and 1994 and 2000-2001, respectively. Also included in the regression but not reported are binary variables for 1-digit SIC code, deal purpose, loan type and whether the loan is performance priced.

Variable	Dividend Restriction	Secured	Financial Covenant	Asset Sweep	Debt Sweep	Equity Sweep
Intercept	0.90	0.99	-0.40	-2.57	-0.61	0.70
	(8.98)	(8.38)	(-1.63)	(-3.17)	(-2.06)	(2.72)
log(Price$_{NoCov}$) - log(Price$_{Cov}$)	-0.16	0.07	0.50	1.60	0.45	-0.40
	(-1.74)	(2.11)	(2.56)	(3.39)	(2.97)	(-2.05)
Log(Maturity)	-0.01	0.05	0.11	0.65	0.16	-0.05
	(-0.67)	(2.92)	(2.95)	(4.10)	(2.89)	(-1.05)
Loan Amount / Assets	-0.10	-0.18	-0.05	-0.29	-0.04	-0.17
	(-2.78)	(-4.47)	(-1.02)	(-4.09)	(-0.58)	(-2.32)
Book Leverage	0.22	0.44	0.13	0.36	0.17	0.26
	(4.22)	(5.96)	(1.61)	(3.49)	(1.60)	(2.49)
Log(Market Cap.)	-0.12	-0.18	-0.04	0.22	0.05	-0.17
	(-8.83)	(-16.15)	(-1.15)	(2.07)	(1.38)	(-3.98)
Log(Market-to-Book)	0.14	0.20	0.13	-0.26	-0.19	0.09
	(5.60)	(6.09)	(2.78)	(-2.06)	(-2.21)	(1.21)
PPE / Assets	-0.10	-0.05	-0.17	-0.14	-0.20	-0.20
	(-2.78)	(-0.70)	(-2.51)	(-1.49)	(-2.44)	(-2.36)
EBITDA / Assets	0.13	-1.02	-1.34	-0.53	1.70	0.75
	(0.37)	(-2.38)	(-2.07)	(-0.89)	(2.04)	(0.91)
Regulated	-0.08	-0.18	-0.08	-0.37	-0.20	0.04
	(-1.94)	(-2.98)	(-1.01)	(-3.56)	(-1.85)	(0.43)
Syndicate Size	0.01	0.02	-0.01	-0.03	0.01	0.02
	(4.19)	(5.18)	(-1.38)	(-1.54)	(1.25)	(2.59)
National Comm. Bank	0.04	-0.05	-0.04	0.15	0.06	-0.01
	(2.56)	(-2.35)	(-1.20)	(3.30)	(1.63)	(-0.26)
State Comm. Bank	0.05	-0.05	0.01	-0.05	0.05	-0.04
	(0.42)	(-0.67)	(0.10)	(-0.41)	(0.39)	(-0.35)
Comm. Bank n.e.c.	0.02	0.04	0.13	-0.03	0.15	0.11
	(0.85)	(1.34)	(3.33)	(-0.58)	(3.68)	(2.46)
Investment Bank	0.05	0.18	0.27	0.27	0.12	0.23
	(1.47)	(4.37)	(5.33)	(3.28)	(1.58)	(3.15)
Term Spread	-0.00	0.01	-0.02	-0.00	-0.07	-0.12
	(-0.21)	(0.53)	(-0.67)	(-0.03)	(-2.15)	(-3.27)
Credit Spread	-0.07	0.21	0.38	0.62	0.45	0.41
	(-1.06)	(2.52)	(3.46)	(4.38)	(3.49)	(2.79)
$I(1990 \leq Year \leq 1994)$	0.00	-0.05	-0.16	-0.03	-0.13	0.11
	(0.02)	(-1.23)	(-1.49)	(-0.36)	(-1.62)	(1.52)
$I(2000 \leq Year \leq 2002)$	-0.00	0.06	0.07	0.00	0.25	0.43
	(-0.05)	(2.08)	(2.24)	(0.00)	(4.32)	(5.35)
Covenant Obs	2,176	2,024	1,043	1,086	777	749
No Covenant Obs	522	1,007	1,361	808	1,069	1,103
$-2Log(Likelihood)$	1,968	2,487	2,722	1,756.57	1,873.01	1,893.36
% Correct Prediction	84	82	71	78.25	75.19	75.00