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The Case of Event Risk Covenants

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COSTLY CONTRACTING:
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ABSTRACT

COSTLY CONTRACTING: THE CASE OF EVENT RISK COVENANTS

By

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The objective of this dissertation is to test the Costly Contracting Hypothesis, as described by Smith and Warner (1979), using the example of event risk covenants. Theory suggests that firms issuing bonds with event risk covenants have more severe agency problems than firms issuing bonds without event risk covenants. Theory also suggests that information asymmetry may be more of a problem for firms issuing bonds with event risk covenants. Empirical tests are performed to determine the relation, if any, between event risk covenant use and severity of agency problems.

An alternative explanation for event risk covenant use is presented and tested. This explanation focuses on managerial entrenchment motives. Previous empirical studies find evidence that managers with small own-firm ownership stakes take actions which maximize their personal wealth instead of stockholders' wealth. Empirical tests in this paper examine the relation between manager own-firm ownership stake and event risk covenant use.

The sample includes all investment grade coupon bonds with maturities greater than five years which were issued by U.S. industrial firms during the period from January 1, 1989

through December 31, 1990. Moody's Bond Record is used to identify sample bonds.

Logistic regression analysis is used to analyze the relation between agency problems, manager own-firm ownership stake and event risk covenant use. Independent variable coefficients are estimated using the method of maximum likelihood.

Results show support for the Costly Contracting Hypothesis. Event risk covenant use is associated with firm characteristics which indicate severe agency problems of free cash flow and debt. Empirical evidence does not find a systematic relation between manager own-firm ownership stake and event risk covenant use. Results of empirical tests of the relation between information asymmetry and event risk covenant use are inconclusive.

DEDICATION

I dedicate this dissertation to my husband, Shawn Rooney, my parents, Mary and Wilbur Kocher and my sisters, Brenda, Diane and Patricia. Their love for me and respect for my work have bolstered me during my long journey through the doctoral program.

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Chapter 1

Introduction

Agency problems arise from conflicting interests among parties to the modern corporation. Agency problems between stockholders and managers and between stockholders and bondholders may affect financing and investing decisions of the firm and reduce firm value. (See Jensen and Meckling (1976), Barnea, Haugen and Senbet (1985), and Jensen (1986)) Thus the resolution of these problems is an important issue in corporate finance.

1.1 Theoretical and Empirical Background

Smith and Warner (1979) present two competing hypotheses, the Irrelevance Hypothesis and the Costly Contracting Hypothesis, to explain how agency problems of debt are resolved. The Irrelevance Hypothesis states that market forces are sufficient to resolve agency problems through price adjustments or claim restructuring; it is based on the work of Fama (1978) and Galai and Masulis (1976). The Costly Contracting Hypothesis states that market forces are insufficient to induce actions which maximize firm value. Under this hypothesis "there is a unique optimal set of financial contracts which maximize the value of the firm." (Smith and Warner (1979)) The Costly Contracting Hypothesis is based on the work of Jensen and Meckling (1976) and Myers (1977).

Recent empirical studies have attempted to explain existing debt contracts by associating firm characteristics with the use of call provisions (Thatcher (1985)), dividend constraints, debt limitations and sinking funds (Malitz (1986)), and sinking funds (Kao and Wu (1990)). Results show support for the Costly Contracting Hypothesis.

1.2 Objective of this Research

The main objective of this research is to test the Costly Contracting and Irrelevance Hypotheses using the example of event risk covenants. Theory related to the Costly Contracting Hypothesis suggests that firms issuing bonds with event risk covenants have more severe agency problems than firms issuing bonds without event risk covenants. It also suggests that information asymmetry may be more of a problem for firms issuing bonds with event risk covenants. Theory related to the Irrelevance Hypothesis suggests that market forces can solve agency problems of debt and therefore firms issuing bonds with event risk covenants should have the same characteristics as firms issuing bonds without event risk covenants.

Event risk covenants provide an interesting test of the Costly Contracting and Irrelevance Hypotheses. Existing empirical studies by Crabbe (1991) and Fields, Kidwell and Klein (1991) show that these covenants are priced by bondholders in the market. However, event risk covenant use did not persist. These covenants were heavily used in 1989

and 1990 and rarely used after 1990. Interesting questions that arise include:

1. Why did firms use event risk covenants? Why not adjust bond prices to compensate bondholders for event risk? Were they a fad or did some firms increase value by using them?

2. How did event risk covenants fit into overall covenant sets? Did they replace other covenants? Or were they used in addition to the usual covenants? What happened in 1991 - did other types of covenants replace event risk covenants?

3. Why did event risk covenant use decrease dramatically after the 1989-1990 period? Are the costs of event risk covenants greater than the benefits? Do macroeconomic factors, such as the availability of credit, affect the decision to use event risk covenants?

The empirical results of this research provide insight into why firms use event risk covenants and how event risk covenants fit into overall covenant sets. Examination of changes in financial market conditions provides insight into why event risk covenant use declined dramatically after 1990.

1.3 Event Risk and Event Risk Covenants

Event risk is defined as the risk of bondholder wealth loss due to a leverage-increasing event, such as a leveraged buyout, leverage-increasing takeover or leverage-financed share repurchase. Event risk covenants usually protect bondholders by allowing them to put bonds back to the issuing firm in exchange for par value if a pre-defined event occurs and bond ratings decrease to speculative grade.

Event risk covenants were first included in bond indentures in 1986. These early event risk covenants, called "poison puts", were at least partially ineffective because they were triggered only if an event was "hostile". Many events which started out in a hostile manner ultimately were declared "friendly" by the target firm's board of directors.

In late 1988, in the aftermath of the RJR Nabisco leveraged buyout, event risk covenants were strengthened by removal of the requirement that an event be "hostile". The new event risk covenants, called "super poison puts", were popular with investors and issuers.[1] Standard and Poor's Corporation responded to their popularity by developing criteria for ranking the strength of event risk covenant protection.

1.4 Approach of this Research

Empirical tests are performed to determine the relation between event risk covenant use and severity of agency problems. Agency problems related to free cash flow, leverage level and asymmetric information are focused on because these problems are relevant to event risk. Results show support for

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[1]The "super poison put" is the main type of event risk covenant used after late 1988. Two other types of event risk covenant are occasionally used, however. A coupon reset covenant calls for the coupon to be reset so that the bond trades at par if an event occurs and the bond is downgraded. The covenant may require that the rating decline be to speculative grade. A "credit sensitive note" calls for specified adjustment of the bond coupon for rating changes. This covenant protects against bond rating declines due to any cause.

the Costly Contracting Hypothesis. Event risk covenant use is systematically related to severity of agency problems of free cash flow and debt. The results regarding the relation between event risk covenant use and information asymmetry are inconclusive.

Also, an alternative explanation for event risk covenant use is presented and tested. This explanation focuses on managerial entrenchment motives. Previous empirical studies (Amihud and Lev (1981) and Walkling and Long (1984)) find evidence that managers with small own-firm ownership stakes take actions which maximize their personal wealth instead of stockholders' wealth. Empirical tests in this paper examine the relation between insider ownership and event risk covenant use. Results show no systematic relation between manager ownership fraction and event risk covenant use.

1.5 Organization of the Dissertation

The dissertation is organized as follows: Chapter 2 presents a review of relevant literature. Chapter 3 develops a theoretical basis for the empirical tests of the Costly Contracting Hypothesis versus the Irrelevance Hypothesis. Chapter 4 describes sample selection and data collection. Chapter 5 explains how proxy variables for agency problems are calculated and discusses empirical methodology. Chapter 6 discusses empirical results. Chapter 7 discusses the analysis of overall covenant sets for long-term bonds issued between 1985 and 1991 by sample firms. Chapter 8 presents a summary

of results and concludes the dissertation.

CHAPTER 2

Literature Review

This chapter presents a survey of relevant theoretical and empirical research. Section 2.1 looks at research on why firms restructure. Motives for restructuring which are related to agency conflicts are emphasized. This research is helpful in identifying firm characteristics that are associated with event risk. Section 2.2 reviews empirical research which documents bondholder wealth changes due to financial restructuring. This research is relevant because it quantifies the effects of leverage-increasing "events" on bondholder wealth. Section 2.3 reviews theory related to agency problems of debt. The theory discussed in this section explains why agency problems related to firm restructuring may cause bondholder wealth losses. Section 2.4 reviews research which focuses on the role of bond contracts in reducing agency problems and maximizing firm value.

2.1 Corporate Financial Restructuring

There are numerous theories that offer explanations for firm restructurings. The theories that appear most relevant for event risk are those based on agency theory. Jensen's free cash flow theory (1986) and Roll's hubris theory (1986) offer explanations for leverage-increasing restructurings. This review of the literature on corporate restructurings

focuses first on agency theory and then briefly discusses other theories on why corporate restructurings occur.

Manne (1965) is the first to propose that corporate control is a valuable asset. He reasons that poorly managed firms have low share prices relative to similar firms with superior management. A low share price causes the firm to be attractive to outsiders who believe they have the ability to manage the firm more skillfully. Manne states that "only the takeover scheme provides some assurance of competitive efficiency among corporate managers and thereby affords strong protection to the interests of vast numbers of small, non-controlling shareholders" (p. 113). Manne's work looks at one aspect of agency problems related to corporate restructuring. Takeovers solve or minimize an agency problem.

Jensen and Ruback (1983) define corporate control as "the rights to determine the management of corporate resources -- that is, the rights to hire, fire and set the compensation of top-level managers" (p. 5). Their review of the extensive literature on the market for corporate control concludes that corporate takeovers generate positive gains, target firm shareholders gain wealth, and bidding firm shareholders do not lose wealth. Also, the gains from corporate takeovers do not appear to come from increased market power. Finally, with the exception of actions that eliminate bidders, such as targeted large block share repurchases and standstill agreements, they do not find that

managerial actions related to corporate control harm shareholders.

Jensen (1986) examines conflicts of interest between shareholders and managers with regard to cash payouts and the role of debt in resolving these conflicts. He states that "the problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies" (p. 323).

Organizations which generate a large amount of free cash flow are likely to have severe conflicts of interest between shareholders and managers. Jensen suggests that these firms can issue new debt and repurchase shares with the proceeds from the debt issue. The interest payments due every period on the debt will impose discipline on managers and reduce the amount of cash over which they have control.

Jensen states that "the control function of debt is more important in organizations that generate large cash flows but have low growth prospects and even more important in organizations that must shrink" (p. 324). Firms that go private through leveraged buyouts (LBO's) are likely to fit this description, according to the free cash flow theory.

Free cash flow theory offers a two-tiered explanation for takeovers. Managers of firms with excess cash and unused borrowing power may attempt to acquire other firms rather than increase payouts to shareholders. These acquisitions are likely to have lower abnormal returns to

shareholders than acquisitions made by firms which have less free cash flow and higher growth prospects.

On the other hand, hostile takeovers of firms which have severe agency problems of free cash flow may increase target firm shareholder wealth. Outside acquirers take over the firm, increasing its debt to a level where the firm cannot continue to operate inefficiently. In order to survive the firm must sell assets, increase the efficiency of operations, and reduce the size of its management staff. These activities are difficult to accomplish unless there is a sense of crisis in the firm.

Hostile takeovers do not have to actually occur for free cash flow problems to be solved. The threat of a takeover may cause firms to engage in a large stock repurchase or an LBO.

Jensen notes that "free cash flow theory predicts that many acquirers will tend to have exceptionally good performance prior to acquisition" (p. 329). He presents the oil industry as an example of an industry with severe free cash flow problems during the period of the late 1970's and the early 1980's. Oil industry firms obtained large amounts of cash flow through price increases in the mid- to late-1970's and used this cash flow to fund additional exploration and drilling projects and to engage in conglomerate acquisitions. Returns from these projects were not favorable.

The free cash flow theory implies that firms with a

large amount of free cash flow and few growth opportunities are takeover targets. They are more likely to be involved in a leveraged buyout or be the target of a leverage-increasing acquisition than the average firm. This has implications for bond investors. If leverage increases, the existing bonds will fall in value because the risk of bankruptcy increases. And if new bonds are issued by a firm with high cash flow and few growth opportunities, prospective investors should anticipate future leverage increases and adjust bond prices and contracts with this in mind.

Lehn and Poulsen (1989) empirically investigate Jensen's free cash flow theory. They look at a measure of free cash flow scaled by the market value of the firm's equity, hereafter referred to as CF/EQ.[1] This measure is calculated for a sample of 263 LBO firms and an equal number of similar size and industry control firms. Average CF/EQ is significantly larger for the LBO sample than for the control sample.

Lehn and Poulsen also look at firm historical sales growth rates for the LBO and control firms. The LBO sample "is characterized by systematically lower growth rates than

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[1]CF/EQ = INC - TAX - INTEXP - PFDDIV - COMDIV where INC is operating income before depreciation, TAX is total income tax, INTEXP is gross interest expense on short- and long-term debt, PFDDIV is total amount of preferred dividend requirement on cumulative preferred stock and dividends paid on noncumulative preferred stock and COMDIV is total dollar amount of dividends declared on common stock.

the control group, significant for three of four measures" (p. 778).

In order to evaluate whether going private transactions are influenced by a threat of a hostile takeover, Lehn and Poulsen create a variable, FOOTSTEPS. FOOTSTEPS takes a value of one if a Wall Street Journal search shows the firm received a takeover offer or was the subject of takeover speculation in the year preceding or following the going private transaction. FOOTSTEPS takes a value of one for 42.6% of the going private sample and 15.1% of the control group. This result supports the idea that going private transactions are a response to the threat of a hostile takeover.

Lang, Stulz and Walkling (1991) examine the relation between free cash flow and the quality of a firm's investment opportunities and bidder returns. Firm investment opportunities are measured by Tobin's q, defined as the ratio of the market value of a firm's assets to replacement cost.[2] The authors note that "firms with substantial cash flow and a low Tobin's q" (Lang, Stulz and Walkling, 1991, p. 321) are expected to have the lowest abnormal bidder returns because these firms have the

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[2]Lindenberg and Ross (1981) describe their procedure for calculating Tobin's q ratio. They use data from SEC form 10-K on replacement costs. Reporting of this data was required starting in 1976. They note that the SEC gave firms "broad leeway" in reporting this data. Lang, Stulz and Walkling report using the procedure described by Lindenberg and Ross (with some modifications) to calculate Tobin's q.

greatest agency costs of free cash flow. The results show that firms with high cash flow measures and low q ratios have the lowest abnormal returns.

Lang, Stulz and Walkling examine other bidder characteristics such as means of payment, bidder managerial ownership, the debt-equity ratio of the bidder, and the logarithm of the size of the target in relation to the bidder. These characteristics do not affect bidder returns in their sample.

Both Lehn and Poulsen and Lang, Stulz and Walkling provide empirical support for Jensen's free cash flow theory. The former provides evidence that firms engaging in LBO's often have a high level of free cash flow and low sales growth, as Jensen's theory predicts. The latter provides evidence in support of Jensen's theory that firms with agency problems of free cash flow have increased incentive to use excess cash for low or negative return acquisitions rather than return it to shareholders.

The hubris hypothesis of corporate takeovers (Roll, 1986) says that takeover bids are made because bidders erroneously believe their valuation estimates are correct. According to this hypothesis, bidders assess the value of a potential acquisition. If their assessment is below the current market price, they do not bid. If their assessment is above the current market price, they place a bid. If the current market price reflects the true value of the firm, bids above and below this price are random errors. The

hubris hypothesis predicts that the total combined wealth gains from a takeover are zero or negative. The increase in value to target shareholders is accompanied by a decrease in value to bidder shareholders.

Roll examines previous studies on changes in total value associated with takeovers. He cites conflicting results from different studies and concludes that the results are uncertain. This is different from Jensen and Ruback's (1983) conclusion that targets gain, bidders do not lose, and takeovers result in overall gains.

Roll suggests that the hubris hypothesis can act as the null hypothesis of corporate takeovers because "it asserts that all markets are strong form efficient. He acknowledges that measurement problems make interpreting bidder returns difficult. For example, bidders usually increase leverage in an acquisition and leverage increases have been shown to result in excess positive returns to firms (Masulis,1980). Also, the bid may have been anticipated or may convey information about the bidder firm. Hubris may have implications for event risk. Roll notes the following:

> The entire sequence of returns for successful bidding firms is consistent with the hubris hypothesis. In the prebid period, excellent performance endows management with both hubris and cash. (p. 210)

The hubris theory, like the free cash flow theory, may provide insight into which firms are likely to increase leverage in a corporate restructuring. Here the type of restructuring is an acquisition. As with free cash flow

theory, a large amount of cash is important.

Jennings and Mazzeo (1991) look at whether management learns from security price changes which occur after the announcement of a proposed acquisition. Their results show no support for the view that bidder management believes share prices provide valuable information. This is consistent with the hubris hypothesis. Hubris suggests that managers believe their valuation estimates are more accurate than the market price.

Other explanations of why corporations restructure can be categorized as follows:[3]

1. Efficiency Explanations
2. Information Explanations
3. Market Power Explanations
4. Tax Explanations

Efficiency explanations state that strategically combining firms leads to operating economies of scale and replacing poor managers with skillful managers in a takeover increases the value of the acquired firm. It may be difficult to distinguish between efficiency explanations and agency theory explanations, note Copeland and Weston (1988), because it is difficult to determine if decisions which lead to poor results are due to manager opportunism or errors in judgement.

Information theories related to mergers and acquisitions are examined by Bradley, Desai and Kim (1983).

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[3]This categorization is taken from Copeland and Weston's text titled Financial Theory and Corporate Policy, 1988.

They examine two explanations for changes in firm value around merger announcements. The first explanation is the "kick in the pants" explanation. The threat of being acquired causes managers to reevaluate and improve their present strategy. The second explanation is the "sitting on a goldmine" explanation. The bidding process causes information about the firm to be released. This new information leads the market to believe the firm has been undervalued.

Increased market power is a possible motivating force behind mergers. However, this force is opposed by the U.S. Department of Justice, on the grounds that monopolies are created and price fixing is facilitated.

Tax factors appear to influence corporate restructuring activities. Several studies have found support for the theory that LBO gains may be partially attributed to tax gains. (See Marais, Schipper and Smith, 1989, and Kaplan, 1989) Mergers and acquisition decisions may be influenced by tax factors in situations where the firm being acquired has accumulated losses which may be used to reduce the taxable income of the acquirer.

Managerial ownership stake appears to influence restructuring activities. Amihud and Lev (1981) examine motives for conglomerate mergers and hypothesize that managers may use conglomerate mergers to reduce employment risk. They find support for this hypothesis in that "manager-controlled firms were found to engage in more

conglomerate acquisitions than owner-controlled firms." (p. 615) These results suggest that the classical assumption that firms maximize stockholder wealth may be violated when managerial ownership stake is small.

Lewellen, Loderer and Rosenfeld (1985) investigate whether "the impact of a merger on bidder firm stock returns is more likely to be negative when management's ownership of the firm's stock is small" (p. 209). A sample of 191 acquiring firms is divided into two subgroups. The first subgroup has positive cumulative prediction errors on stock returns during the period from five days prior to the merger offer announcement through merger resolution. The second subgroup has negative cumulative prediction errors on stock returns during this period. Average values for three variables are calculated for each of three senior executive categories.[4]

Results show that managers and directors with large equity holdings in their firms are less likely than managers with small equity holdings to engage in acquisitions that decrease shareholder wealth.

According to the results of this research, managers'

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[4]The three variables are defined as follows:

VALSHS/Pay = dollar value of own-company stockholdings, divided by aggregate current remuneration;
SHAREINC/Pay = expected annual income from own-company stockholdings, divided by aggregate current remuneration;
ALFA = number of shares held by management divided by the total number of shares outstanding;

and directors' own-firm equity ownership stakes influence the acquisition decisions they make. There is no reason to believe acquisitions are the only decisions influenced by executive ownership stake. For example, firms with a low manager ownership stake may be more likely to attempt to discourage hostile takeovers than firms with a high manager ownership stake.

Walkling and Long (1984) look at a sample of cash tender offers and find that takeover bid resistance is related to manager and director personal wealth changes. If managers and directors stand to gain wealth in a takeover, they are less likely to resist. These results support the development of executive compensation plans which align owner and manager incentives.

2.2 Effects of Restructuring on Bondholder Wealth

Part A examines possible reasons corporations enter into leverage-increasing restructurings. This section examines the effects of such restructurings on the wealth of preexisting bondholders. The risk of wealth loss due to a leverage-increasing corporate restructuring is often referred to as "event risk". Event risk is also discussed in terms of how it affects new issue bonds. Here event risk covenants are described and recent empirical studies which attempt to measure price effects of event risk covenants are summarized.

Kim, McConnell and Greenwood (1977) examine how a

violation of a me-first rule affects the value of a corporation's stock and bond securities. They define a me-first rule as a "prior arrangement to protect bondholders from uncompensated shifts of wealth from bondholders to stockholders through a change in the capital structure of the firm" (p. 789). A theoretical analysis of me-first rule violation is presented and then an empirical analysis of stockholder and bondholder returns in firms that have formed captive finance subsidiaries is performed.

The theoretical analysis demonstrates that in perfect capital markets, bondholders will be worse off and stockholders will be better off if the firm is able to increase debt and violate the me-first rule protecting the original bondholders. In the portion of the analysis which considers corporate income tax, the authors show that the federal government shares the stockholders' gains.

Kim, McConnell and Greenwood present a situation in which a corporation forms a captive finance subsidiary as an example of a violation of a me-first rule in which the legal terms of the debt contract are not violated. The authors describe formation of the finance subsidiary as follows:

> firms ... organize the finance company which then issues debt in its own name, but which is guaranteed by the assets and earnings of the parent company. The proceeds of the debt issue are then used to purchase the parent company's accounts receivable. Thereafter, the creditors of the subsidiary have first claim to the income produced by the sales contracts owned by the finance company. Only after the claims of the subsidiary's creditors are met in full may any funds be

> transferred from the wholly-owned subsidiary to the parent company to pay its creditors. This rearrangement of the asset and liability structure of the firm essentially creates a new class of security holders with claims that are superior to those of the old bondholders. (p. 797)

The empirical analysis examines stockholder and bondholder abnormal returns for twenty-four firms which formed captive finance subsidiaries between 1940 and 1971. Stockholder abnormal returns are calculated with a two-factor model (as described by Black, Jensen, and Scholes (1972) and Fama and MacBeth (1973)). Bondholder abnormal returns are calculated using a paired-comparison procedure.

The empirical results show that stockholders earned positive abnormal returns and bondholders experienced negative abnormal returns on formation of a captive finance subsidiary.

A similar study on violation of me-first rules by Kim, Lewellen and McConnell (1978) looks at sale-leaseback transactions. This paper theoretically examines sale-leaseback transactions in a perfect market context.

In a sale-leaseback arrangement, the lessor advances cash to the lessee in exchange for a series of promised lease payments and a priority claim to the residual value of the leased asset. The lessor should be concerned with the creditworthiness of the lessee and the value of the leased asset, which may be viewed as collateral for a loan.

Kim, Lewellen and McConnell provide an analysis which shows how the market value of the firm's bonds must decline

in a sale-leaseback transaction, as long as the lessee has a finite probability of becoming bankrupt. This is because "...the sale-leaseback diverts to the lessor a priority claim to a segment of the cash flow prospects which originally belonged to bondholders" (p. 875).

Both the paper on sale-leasebacks by Kim, Lewellen, and McConnell and the paper on captive finance subsidiaries by Kim, McConnell and Greenwood provide examples of bondholder wealth expropriation through rearrangement of firm capital structure. In other words, these papers address "event risk". The theoretical analyses presented in these papers helps clarify the security value changes that appear to occur in contemporary firm "events".

Recent empirical studies have examined bondholder wealth changes after leverage-increasing financial restructurings. Lehn and Poulsen (1988) study bondholder returns after LBO's and find that bond prices decrease by 2.46 percent over a 20-day period centered on the announcement date. Their sample is composed of only nine bonds, however. (106 LBO's are in their original sample; bond price data is available on only 9 bonds.)

Marais, Schipper and Smith (1989) study the effects of going-private transactions on the wealth of existing bondholders over the period 1974 through 1985. They find no evidence of abnormal returns to these bondholders, but do note that bondholders experienced rating downgrades as a consequence of the LBO's. It does not seem correct that

bondholders would experience rating downgrades without losing wealth. Rating downgrades mean default risk is increased. The bond market will require yield increases to compensate for default risk increases. It seems probable that the results of Marais, Schipper and Smith are influenced by a lack of availability of bond price data.

Asquith and Wizman (1990) study 214 bonds associated with 65 LBO targets over the 1980-1988 period. They find negative two percent abnormal returns for the entire sample over a period from two months before the announcement until two months after the LBO bid is either successfully completed or withdrawn. Covenant protection is important in explaining their results. Bonds with strong covenant protection receive average abnormal returns of positive 2.6 percent (over a period -2 months to +2 months). Bonds with weak (no) protection receive -0.7 percent (-5.2 percent) abnormal returns.[5]

Warga and Welch (1990) investigate bondholder wealth changes associated with LBO's in the 1985-1989 period. They use trader-quoted prices and show that bondholders experience negative seven percent risk-adjusted returns over a period from two months prior to one month after the LBO

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[5]Asquith and Wizman describe their method for classifying covenant protection. See Chapter 7 of this dissertation for a summary of their classification criteria.

announcement date.[6]

Crabbe (1991) documents bondholder wealth losses for 56 industrial bonds that are downgraded after leveraged restructurings during the period between January 1983 and August 1989. Crabbe notes that "prices of the downgraded bonds fell an average of 11.83 percent when measured from the re-offering date to the downgrade date" (p. 694).[7] Crabbe also measures abnormal returns six months and one year before the downgrade date and finds negative abnormal returns over these periods of 7.77 percent and 9.01 percent, respectively.

The difference in findings between the earlier empirical works by Lehn and Poulsen (1988) and Marais, Schipper and Smith (1989) and the slightly more recent works by Asquith and Wizman (1990), Warga and Welch (1990) and Crabbe (1991) may be due to variations in sample periods and methodologies.

Overall, the evidence appears to indicate that leveraged restructurings, especially LBO's, cause existing bondholders to lose wealth. Section 2.3 discusses this wealth loss in terms of agency conflicts between bondholders and stockholders.

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[6]Warga and Welch (1990) state that trader-quoted prices represent dealer offers or actual trades and reflect all available information in competitive markets.

[7]The re-offering date is the date the bonds were originally sold to the public through the underwriter.

2.3 Agency Problems of Debt

Previous sections of this literature review have examined research related to why firms restructure and how restructuring affects bondholders. This section looks at research which attempts to explain why bondholders lose wealth when leverage suddenly and significantly increases.

Jensen and Meckling (1976) demonstrate how the existence of agency costs leads to an internal optimal capital structure for the modern corporation. The first part of their analysis shows how a manager-owner of a firm has greater incentive to consume perquisites as his/her ownership fraction decreases. This occurs because the manager-owner bears only a portion of the cost of the perquisites consumed. The second part of the paper shows how agency costs of debt increase as the debt ratio increases, because stockholders have opportunities to expropriate bondholder wealth. Common mechanisms for bondholder wealth expropriation include firm cash flow variance increases and bondholder claim dilution.

Agency costs arise when manager-owners have an opportunity to switch to high variance projects after issuing new debt. Suppose bonds are priced at B_1 if project 1, a low variance project is accepted. The bonds are priced at B_2 if project 2, a high variance project is accepted. (Assume here that project 1 and project 2 have the same expected total payoffs which occur at time T.) Manager-owners can maximize their own wealth, at the expense of the

bondholders, if they lead bondholders to believe they are going to choose project 1 and then, after debt is issued at B_1, switch to project 2.

Galai and Masulis (1976) use the Black-Scholes (1973) option pricing model to explain why equity value increases when owner-managers switch to high variance projects. Stockholders of a levered firm can be thought of as holding a European call option on the value of the firm. This option has an exercise price equal to the maturity value of the firm's risky debt. The option may be exercised at the maturity date of the debt. Merton (1973) shows how variance is positively related to option value. If the firm chooses project 2, the project with the higher variance, the value of the owner-managers' option increases. The value of the debt must decrease as the value of the option increases, because $B = V - S$, where B is the value of the debt, V is the value of the firm, and S is the value of the equity.

Bondholders know that owner-managers can promise to take project 1, issue risky debt at a price B_1, and then switch to project 2, causing the risky debt to fall in value to B_2. Bondholders anticipate this expropriation opportunity and only pay B_2 for the firm's debt securities. In this case, there is no redistribution of wealth and no agency cost.

If project 2 has a lower expected value than project 1, however, there is an agency cost. If owner-managers accept project 2, the high variance project, the value of the firm

will fall. The change in firm value can be expressed as follows:

$$V_1 - V_2 = (S_1 - S_2) + (B_1 - B_2)$$

In the above equation, owner-managers can gain while bondholders lose and the total value of the firm decreases. But if bondholders anticipate owner-manager opportunities to switch to high variance projects, no bondholder wealth loss occurs and the owner-managers incur the wealth loss.

Jensen and Meckling note that bondholders can include covenants in debt agreements which prohibit managers from engaging in actions that expropriate bondholder wealth. Covenants are costly to use and for this reason are not written so as to protect bondholders from every managerial action that has potential to reduce bond value. Costs associated with covenants include "the costs involved in writing such provisions, the costs of enforcing them and the reduced profitability of the firm (induced because the covenants occasionally limit management's ability to take optimal actions on certain issues)..." (Jensen and Meckling, 1976, p. 334).

Jensen and Meckling also discuss bankruptcy and reorganization costs. They note that the expected value of bankruptcy and reorganization costs are of interest to purchasers of fixed claims because if these costs are incurred, there is less wealth available to satisfy existing fixed claims. Warner (1975) studies railroad bankruptcies and finds very small bankruptcy costs (as a fraction of the

value of the railroad three years before the bankruptcy occurred) for a sample of eleven railroad bankruptcies.

Myers (1977) analyzes an agency problem of debt referred to as "the underinvestment problem". This problem occurs when stockholders forego low variance positive NPV projects because the benefits mostly accrue to bondholders. As leverage increases, this agency problem of debt becomes more severe. As with the other agency problems of debt, the agency costs are borne by the stockholders.

Stiglitz and Weiss (1981) present a theoretical model of an equilibrium loan market characterized by credit rationing. In their model, banks are concerned with the interest rate they receive on a loan and the riskiness of the loan. Interest rates have screening properties, in that low risk borrowers will not pay high rates of interest.

Assume that banks lend to two types of credit risks, good and poor credit risks. These two groups of borrowers are observationally identical. At low interest rates banks lend to both groups of credit risks. As interest rates are raised, however, the good credit risks drop out or switch to projects which have "lower probabilities of success but higher payoffs when successful" (p. 393). Banks offering loans at high interest rates will attract high risk borrowers. Therefore, each bank should have an optimal interest rate where the marginal income earned from making loans is equal to the marginal cost of lending to poor credit risks. Demand for credit may exceed supply at this

interest rate. But the bank will not raise the interest rate to bring demand down to supply. Instead credit rationing will occur.

The Stiglitz and Weiss theory may help explain event risk and event risk covenant use. Some institutional investors, such as pension funds, do not want to invest in low-grade bonds. They also want to avoid investment grade bonds which may be downgraded due to a leveraged restructuring. A higher rate of return will not induce them to invest in low-grade bonds or investment grade bonds with high event risk because the risk of default is still present and this risk is incompatible with their risk preferences. These institutional investors may avoid corporate bonds altogether, or at least corporate bonds which have a significant probability of being downgraded in a restructuring, unless a provision, such as a "super poison put" provides them with a way to get rid of a downgraded bond without accepting the post-downgrade market price.

2.4 The Role of Indenture Covenants

Smith and Warner (1979) describe competing hypotheses related to the use of bond covenants. The Irrelevance Hypothesis states that external markets have mechanisms for ensuring that stockholders maximize firm wealth rather than stockholder wealth. Therefore, stockholders should be indifferent between paying a higher rate of return on bonds and including a bond covenant in the bond indenture. Bond

covenants, according to this hypothesis, are neutral mutations. Fama (1978) supports the Irrelevance Hypothesis. He argues that if the firm does not follow a strategy to maximize total firm value, it will pay for outsiders to take over the firm and institute a value-maximizing strategy.

The Costly Contracting Hypothesis states that covenants are costly and will not persist in bond contracts unless they are useful in reducing agency costs of debt. Jensen and Meckling (1976) support the Costly Contracting Hypothesis in their analysis of agency costs of debt. They refer to costs associated with bond covenants as monitoring costs and state that bondholders will use covenants up to the point where the "nominal" marginal cost of using covenants is equal to the marginal benefits. The term "nominal" is used because the cost of covenants is borne by stockholders, not the bondholders.

This research hypothesizes that firms using event risk covenants have more severe agency problems of debt than firms not using these covenants. Empirical results which show a positive relation between magnitude of agency problems and the use of costly covenants support the Costly Contracting Hypothesis. Studies by Thatcher (1985) and Malitz (1986) investigate whether firm characteristics associated with agency problems of debt are related to the use of two-tiered call provisions (Thatcher) and to the use of dividend constraints, debt constraints, and sinking funds (Malitz). The results show a systematic relation between

firm characteristics which indicate severe agency problems of debt and complex contractual provisions. Kao and Wu (1990) investigate whether the probability of including a sinking fund provision in a bond contract is related to firm and bond characteristics. They show a systematic relation between firm characteristics which indicate severe agency problems and sinking fund use. This research focuses on the use of event risk covenants.

Two previous studies examine event risk covenant use. Crabbe (1991) and Fields, Kidwell and Klein (1991) investigate whether event risk covenants are priced by the market. Crabbe documents savings of 24 basis points for firms that include event risk covenants in new issue bond indentures. He also examines the secondary market and documents savings of 32 basis points for bonds with event risk covenants at the end of 1989.

Fields, Kidwell and Klein relate the value of event risk covenants to the environment for corporate control. They find that before the RJR/Nabisco buyout, bonds with event risk covenants "sold for penalty yields compared with similar bonds without poison put provisions" (Fields, Kidwell and Klein, 1991, p. 19). After the RJR/Nabisco buyout, they find that new issue yields increased by 26.4 basis points and bonds with event risk covenants sold for 12.3 basis points less than similar bonds without poison put provisions. They also find that bonds with low ratings value event risk covenants more and that event risk

covenants with the highest S&P event risk covenant rankings save issuers the most basis points.

Warga and Welch (1990) analyze bond maturity and bond rating in terms of their relation to the magnitude of bondholder wealth losses in LBO's. They find that bonds with long maturities lose more wealth than bonds with short maturities. This is consistent with findings by Crabbe and Fields, Kidwell and Klein that bonds with long maturities include event risk covenants more often than bonds with shorter maturities. Warga and Welch also find that bonds with high ratings lose more wealth than bonds with lower ratings. This is inconsistent with the finding of Crabbe and Fields, Kidwell and Klein. Crabbe and Fields, Kidwell and Klein find that bonds with ratings below AA most frequently include event risk covenants. Fields, Kidwell and Klein also find that as rating decreases toward speculative grade, the market values event risk covenants more.

2.5 Summary of Chapter Two

A major finding of studies reviewed in section 2.1 is that firms may increase leverage in a restructuring event in order to decrease agency problems between managers and stockholders. As agency problems between managers and stockholders decrease, however, agency problems between stockholders and bondholders increase. Empirical research reviewed in section 2.2 provides evidence that bondholder

wealth is reduced by leverage-increasing restructuring events.

Section 2.3 reviews research which offers explanations of how bondholder wealth is reduced by an increase in firm leverage. The explanations focus on claim dilution, a risk incentive problem, and an underinvestment problem.

Finally, section 2.4 looks at the role of bond indenture covenants in resolving agency problems of debt. Several empirical studies show a positive relation between severe agency problems of debt and the use of call provisions, sinking funds, dividend constraints and debt constraints. This dissertation seeks to provide further insight into the role of bond covenants in reducing agency problems. More specifically, it empirically analyzes the relation between firm characteristics which proxy for agency problems and event risk covenant use. Chapter three develops a theoretical basis for the empirical analysis that follows.

Chapter 3

Hypothesis Development

Smith and Warner (1979) present two competing hypotheses about how firm value is influenced by debt contracts. "The Irrelevance Hypothesis is that the manner of controlling the bondholder-stockholder conflict does not change the value of the firm." (Smith and Warner, 1979, p.120) "The Costly Contracting Hypothesis is that control of the bondholder-stockholder conflict through financial contracts can increase the value of the firm." (Smith and Warner, 1979,p.121) Empirical evidence which shows a systematic relation between covenant use and firm characteristics which proxy for agency problems is more consistent with the Costly Contracting Hypothesis.

This research focuses mainly on the relation between covenant use and agency problems related to event risk. Event risk is an interesting problem to investigate because it is affected by manager/stockholder conflicts as well as stockholder/bondholder conflicts. The research addresses interdependencies that naturally exist between parties to the firm and examines how bond contracts are affected by these interdependencies.

Theory is used to identify firm characteristics which proxy for agency problems related to event risk. The paragraphs that follow discuss relevant theory and identify firm characteristics which proxy for agency problems in the

empirical tests. The agency problem of free cash flow, agency problem of information asymmetry and agency problem of debt are considered relevant to event risk.

3.1 The Agency Problem of Free Cash Flow

Jensen's (1986) free cash flow theory states that firms with few growth opportunities and excess free cash flow have incentives to increase leverage. Leverage can be increased by a leveraged buyout, a debt-financed share repurchase, or a debt-financed takeover. The discipline imposed by the additional debt burden reduces managers' opportunities to waste cash flow.

Prospective bondholders of firms with a free cash flow problem recognize the potential for a dramatic increase in leverage. A dramatic increase in leverage causes claim dilution and a more severe risk incentive problem. It is rational for prospective bondholders to demand compensation for event risk or require that an event risk covenant be present in the bond contract. Empirical findings which show that firms with excess free cash flow and few investment opportunities are likely to use event risk covenants provide support for the Costly Contracting Hypothesis. Findings which show no such relation provide support for the Irrelevance Hypothesis.

3.2 The Agency Problem of Debt

Jensen and Meckling (1976) show how agency problems of debt become more severe as debt ratio increases. The risk of bankruptcy rises and the risk incentive problem becomes more severe as leverage increases.

Event risk is about future possible leverage increases. This research postulates that the debt ratio at the time a bond is issued influences event risk. Firms that already have a large amount of debt have less ability to remain solvent when an additional increment of debt is issued. They are, in a sense, 'close to the edge'.

Stiglitz and Weiss (1981) present a model which shows how markets can fail when agency problems of debt are severe. The analysis assumes that good credit risks refuse to pay high interest rates. Some lenders are better off providing capital to the average borrowers at low rates than lending to high risk borrowers at high rates. Thus credit rationing occurs in equilibrium.

The Stiglitz and Weiss theoretical framework offers an explanation for event risk covenant use. Institutional bond investors, such as pension funds, often prefer investment-grade debt. Riskier debt is not compatible with their investment objectives. Some of these investors face restrictions on the amount of speculative-grade debt they may carry in their portfolios. Thus, investment-grade bonds issued by firms which are likely to be involved in a leverage-increasing event are undesirable unless event risk

covenants are present. The closer a bond is to a speculative rating before an event, the more likely it is to become speculative-grade after an event.

Empirical results which show a positive relation between debt ratio and event risk covenant use support the Costly Contracting Hypothesis. Results which show no significant relation between debt ratio and event risk covenant use support the Irrelevance Hypothesis.

3.3 Information Asymmetry

The agency problem of information asymmetry may lead to a situation in which firm value is maximized by including an event risk covenant in the bond indenture. (Barnea, Haugen and Senbet, 1985) Suppose a firm decides to issue bonds to fund a new project. Firm insiders (managers) believe the project is worth V_a. Outsiders (prospective bondholders) believe the project is worth V_b, where V_b is less than V_a. The market price of the bonds will be V_b unless insiders can send an unambiguous signal about the value of the project. The difference between V_a and V_b is the agency cost of information asymmetry.

High event risk firms are in a situation similar to the one described above. Prospective bondholders anticipate a leverage-increasing event and price bonds accordingly. The firm's managers may believe prospective bondholders are overly pessimistic and are unfairly pricing the bonds. They can use an event risk covenant to signal that they believe

an event is unlikely. This is an effective signal because it is costly to mimic for firms in which an event is likely. Event risk covenants provide prospective bondholders with an opportunity to cash in their bonds for par value if both a leverage-increasing event and a bond rating downgrade occur.

The agency problem of information asymmetry cannot be solved by market forces. Therefore, results which show a systematic relation between event risk covenant use and firm characteristics which proxy for information asymmetry provide insight into the role of information asymmetry in determining bond contracts without differentiating between the Irrelevance Hypothesis and the Costly Contracting Hypothesis.

3.4 Manager Entrenchment - An Alternative Explanation

Manager Ownership fraction appears to influence restructuring activity. Amihud and Lev (1981) and Lewellen, Loderer and Rosenfeld (1985) provide empirical evidence that firms with low manager ownership stakes may be more likely to attempt to discourage hostile takeovers than firms with high manager ownership stakes.

Morck, Shleifer and Vishny (1988) hypothesize that mangers respond to two opposing forces:

1. Manager personal interests (which may conflict with shareholder interests).
2. Manager interests in the value of the firm's equity.

The relation between ownership and value depends on which of

the above forces dominate. Morck, Shleifer and Vishny (1990) find empirical evidence that managers' personal objectives influence acquisition activities.

Managers may use event risk covenants to make takeovers more difficult. If outstanding bonds have event risk covenants which are triggered in a takeover, the new management must either refund those bonds or raise the coupon rate (depending on the specific provisions of the covenant). According to theory, the managers most likely to use event risk covenants to discourage a takeover are those with a small own-firm ownership stake. Empirical tests which show a negative relation between manager ownership stake and event risk covenant use provide support for this explanation of event risk covenant use.

3.5 Summary

This research relates event risk covenant use to severity of agency problems in an attempt to find support for either the Irrelevance Hypothesis or the Costly Contracting Hypothesis. Firm characteristics which proxy for agency problems are identified using existing theory. Results which show no systematic relation between proxy variables and event risk covenant use support the Irrelevance Hypothesis.

Results which show the following relations provide support for the Costly Contracting Hypothesis:

1. a negative relation between firm size and event risk covenant use;
2. a negative relation between future investment opportunities and event risk covenant use;
3. a positive relation between debt level and event risk covenant use;
4. a positive relation between information asymmetry and event risk covenant use;

Managerial Entrenchment is examined as another explanation for event risk covenant use. Results which show a negative relation between manager own-firm ownership stake and event risk covenant use provide support for the managerial entrenchment explanation.

Chapter 4

Data

This chapter presents a description of the data used in this research. Section 4.1 describes how sample bonds and firms are identified. Section 4.2 discusses financial statement data used in the calculation of proxy variables for agency problems. Section 4.3 discusses how information on specific event risk covenants is obtained. Data used in the calculation of the information asymmetry proxy and manager ownership proxy are discussed in sections 4.4 and 4.5, respectively. Data on overall covenant sets for sample bonds is described in section 4.6.

4.1 Sample Bonds and Firms

To examine the relation between agency problems and event risk covenant use, all U.S. industrial firms issuing publicly traded investment grade bonds between January 1, 1989 and December 31, 1990 are identified. This study focuses on industrial firms because other industry groups often have regulatory constraints which may influence the likelihood of a leverage-increasing event. Investment grade bonds are selected because speculative grade bonds rarely have event risk covenants. The study period is chosen because this is when event risk covenants were most heavily

used.[1]

Among the identified firms, only those issuing at least one bond with a face value of greater than or equal to $25 million and a maturity of greater than or equal to five years are included in the sample. This criteria is established to facilitate comparison with other studies on event risk covenant use. Firms issuing only zero coupon bonds are also excluded from the sample.[2] This is because firm characteristics which influence the choice of zero coupon bonds versus coupon bonds may also influence decisions related to event risk covenant use.

Moody's Bond Survey is used to identify new issue bonds. In 1989, 62 firms issuing 114 bonds meet sample criteria. In 1990, 64 firms issuing 117 bonds meet sample criteria. Panel A of Table 1 presents a brief description of sample bonds. Appendix 4.1 lists sample firms, the dollar face value of the debt they issue during the sample period, and whether or not the debt had event risk protection.

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[1]According to Fields, Kidwell and Klein (1991), one bond with an event risk covenant was issued between October 21, 1988 and December 31, 1988.

[2]Three firms are excluded from the sample in 1989 because they issue only zero coupon bonds. Seven firms are excluded in 1990 because they issue only zero coupon bonds.

TABLE 4.1

Panel A
Number of Firms and Bonds That Meet Sample Criteria During Period from January 1, 1989 to December 31, 1990

Calendar Year	1989	1990
Number of Bonds	114	117
Number of Firms	64	62
Number of Bonds with Event Risk Covenants	25	17
Number of Convertible Bonds	5	1*

The sample includes all industrial firms issuing investment-grade coupon bonds which have a face value greater than $25 million and a maturity of greater than 5 years during the sample period.

Panel B
Number of Bonds in Each Standard and Poor Corporation Event Risk Ranking Category

1989 Bonds with Event Risk Covenants	
Ranking = E1	1
Ranking = E2	0
Ranking = E3	21
Ranking = E4	3
Ranking = E5	0
1990 Bonds with Event Risk Covenants	
Ranking = E1	4
Ranking = E2	0
Ranking = E3	9
Ranking = E4	3
Ranking = E5	1

The levels of protection as ranked by Standard and Poor Corporation are listed below:

E1	Strong protection	E4	Weak protection
E2	Significant protection	E5	Insignificant or no protection
E3	Some protection		

* Three zero coupon convertible bonds were issued in 1990. Zero coupon bonds are not included in this sample.

4.2 Financial Statement Data

Financial statement data for sample firms is obtained from Compustat and is used to calculate proxy variables for firm size, investment opportunities, free cash flow, and leverage level.[3] Compustat data is obtained for the fiscal years ending prior to the year in which sample bonds are issued.[4]

A sample firm that issues several bonds in a fiscal year is observed only once for that year in empirical tests.[5] There are two reasons for this practice. First, variables which measure firm-specific characteristics such as size and cash flow are identical for several observations if each bond is considered an observation. Second, some firms issue several small face value bonds and others issue one large face value bond. Thus, the number of bonds issued

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[3]Two sample firms have very little Compustat data available. Lyondell Petrochemical was spun off from Arco in 1988. It appears on the Annual Compustat tape but many data items are unavailable. Conagra acquired Beatrice foods in 1988. It appears on the Annual Compustat tape but many 1989 data items are unavailable.

[4]For sample firms which issue one bond in 1989 and/or one bond in 1990, the issue date of the bond(s) is used to determine which fiscal years financial statement data comes from. For example, if a bond is issued in November 1989 by a firm with a September fiscal year end, it is issued in the 1990 fiscal year. Financial statement data from fiscal 1989 (and fiscal years prior to 1989 for variables which require more than one year worth of data) is used to calculate proxy variables.

[5]A firm with a fiscal year-end month other than December may issue several bonds in a specified calendar year that are not in the same fiscal year. This does not occur here. If it did occur, the firm would be observed once for each fiscal year in which a bond is issued.

is not a useful measure.

For firms which issue more than one bond in a fiscal year, the bond with the largest face value is chosen as the sample bond.[6] The sample bond is used to determine the firm's event risk protection status and the fiscal years for which financial statement data is needed.

4.3 Event Risk Protection

Standard and Poor's Creditweek provides information on whether or not a new issue bond has event risk protection. Standard and Poor's Corporation (hereafter S&P) began ranking new issue bonds in terms of their event risk protection in July 1989. S&P's ranking system assesses the strength of covenant protection against a sudden and dramatic decrease in credit quality. This ranking system does not assess the likelihood of an "event".

S&P's ranking system has five categories:

E-1	Strong Protection
E-2	Significant Protection
E-3	Some Protection
E-4	Weak Protection
E-5	Insignificant or No Protection

Bonds issued prior to July 1989 which have event risk covenants were assigned rankings in the months following the initiation of this service. New issues with event risk covenants were ranked throughout the rest of 1989 and 1990.

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[6]If the two largest bonds have the same face value, then the bond with the longest maturity is chosen. If the maturities are identical, then the bond issued first is chosen.

In 1991, event risk covenant rankings appeared infrequently as event risk covenant use became infrequent.

Sample period issues of Creditweek provide information on which firms use event risk covenants, the ranking of the covenants, and a brief description of the covenant details. Sample bonds are coded "1" if a covenant ranked E-1, E-2, E-3, or E-4 is present. Sample bonds are coded "0" if a covenant ranked E-5 or no covenant is present.[7] Panel 2 of Table 1 presents data on the number of sample bonds in each event risk covenant ranking category. Twenty two firms issued 26 bonds with event risk protection in 1989. Eleven firms issued 16 bonds with event risk covenants in 1990. In terms of dollar face value, 19% of the coupon debt issued by U.S. industrial firms in 1989 has event risk protection and 10% of the coupon debt issued by U.S. industrial firms in 1990 has event risk protection.

As mentioned previously, some firms issue more than one bond in a fiscal year. For these firms the event risk ranking of the bond with the largest face value is used to determine the firm's event risk protection status. Most sample firms which issue more than one bond in a fiscal year either have event risk protection on all of their bonds or have no event risk protection on all of their bonds. Three firms, however, issue bonds which differ in event risk protection during the sample period. For all three of these

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[7]Only one bond issued after January 1, 1989 had an E-5 covenant.

firms, the bonds with event risk protection have larger face values and longer maturities than the bonds without event risk protection.[8]

Most sample firms which issue bonds in both 1989 and 1990 either include event risk covenants in both years or do not use event risk covenants in either year. Four sample firms which issue bonds in both years include event risk covenants in only 1989 or only 1990, however. In three of the four firms it appears that bond maturity may influence the decision to include an event risk covenant.

4.4 Insider Ownership Data

Data on the fraction of equity owned by people who are considered insiders at a corporation is provided by Value Line Investment Survey. Value Line publishes quarterly company evaluations for investors.

For each sample bond, data on insider ownership is collected from the Value Line analysis which is within 1.5 months of the bond issue date. The objective is to use insider ownership information which would have been considered current by managers engaged in approving new borrowing agreements. For most sample firms, ownership fraction is stable from quarter to quarter. For firms which

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[8]An alternative rule is to classify firms as having event risk protection if the face value amount of bonds with event risk protection is greater than the face value amount of bonds without event risk protection. This rule results in the same event risk status for sample firms as the rule which chooses the bond with the largest face value.

issue more than one bond in a fiscal year, the ownership fraction associated with the bond which has the largest face value is chosen as the insider ownership fraction for the firm. If the two largest bonds have the same face value, the bond with the longest time to maturity is chosen. If the two largest bonds have the same face value and time to maturity, the bond with the earliest issue data is chosen. Appendix 4.1 of this chapter lists sample firms by insider ownership fraction. This appendix also lists "other significant ownership" fraction as reported in Value Line.

For twelve firm observations, the information in Value Line does not provide a clear picture of insider ownership. For example, the Value Line information on insider ownership of Ford Motor Company states that "Ford family, officers and directors own 9% of stock, have 40% of voting power".[9] Insider ownership fraction was coded as a missing value for these firms.

4.5 Earnings Forecast Variability as a Measure of Information Asymmetry

IBES analysts' earnings forecasts are used in a measure of information asymmetry. Earnings forecasts for the fiscal year end preceding the sample bond(s) issue date(s) are collected from the I/B/E/S U.S. detail tapes. Only new or newly updated forecasts made six months before the fiscal

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[9]This information is from Value Line Investment Survey, December 23, 1988.

year end are used. The decision to use forecasts made six months before the fiscal year end is arbitrary. There is no theoretical reason for choosing the mid-year forecast over beginning or end of the year forecasts. It is important that forecasts from the same month of the fiscal year be chosen for all sample firms. Otherwise, differences in variability of forecasts across firms might be due to the fact that some firms are near the end of their fiscal years while others are at the start or midpoint. As a firm approaches the end of its fiscal year, much uncertainty regarding year-end earnings is resolved.

4.6 Overall Covenant Sets for Sample Firms

Covenant sets of sample firms are evaluated by examining bond indenture descriptions in Moody's Industrial Manual (1992). Covenant sets are examined during three time periods:

1. January 1985 - December 1988
2. January 1989 - December 1990
3. January 1991 - June 1992

These three time periods are chosen to provide a summary of how covenant use varied before, during and after the time period during which event risk covenants were popular.

Data on individual bonds issued during the specified time periods is collected and recorded. The following information is included:

1. Bond maturity, face value, coupon rate and rating;
2. Type of bond (such as subordinated debenture, convertible bond, or medium term note);
3. Purpose of the bond issue;
4. Underwriter(s);

Also, note is made of the presence of the following indenture covenants or provisions:

a. call provision
b. event risk covenant
c. sale/leaseback covenant
d. security provision
e. limit on additional secured debt
f. limit on dividends and other cash payouts
g. limit on total funded debt
h. postmerger net worth restriction
i. put provision
j. sinking fund

APPENDIX 4.1a

APPENDIX 4.1a

List of Sample Firms

1989 Sample Firms

Firm Name	Face Value # ($ millions)	Event Risk Covenant
AAR Corp	$ 65	Yes
Alcan Aluminum	$ 150	No
American Brands	$ 100	No
Anadarko Petroleum	$ 100	No
Anheuser-Busch	$ 842	Yes *
Arco Chemical	$ 125	No
Arkla, Inc.	$ 200	Yes
Ashland Oil	$ 200	No
Baxter International	$ 250	No
Becton Dickinson	$ 100	Yes
Boise Cascade	$ 250	Yes *
Borden	$ 150	Yes
Bowater	$ 300	Yes
Caterpillar	$ 300	No
Chrysler	$ 250	No
Coastal Corporation	$ 200	Yes
Deere & Co.	$ 350	No
Dillard Dept. Stores	$ 100	No
Dow Chemical	$ 150	No
Dupont de Nemours	$ 300	No
Eastman Kodak	$ 650	No
Eaton Corporation	$ 100	Yes
Exxon	$ 400	No
Fleming Companies	$ 150	No
Ford Motor Co.	$ 850	No
General Electric	$ 700	No
General Motors	$1550	No
Grumann Corporation	$ 200	Yes
Home Depot	$ 225	No
IBM	$ 750	No
ITT Corporation	$1400	No
Knight-Ridder	$ 200	Yes
Limited (The)	$ 100	No
Lockheed Corporation	$ 300	Yes
Loews Corporation	$1075	No
Lyondell Petrochemical	$ 300	Yes
Maytag	$ 175	No
McDonalds	$ 200	No
Monsanto	$ 100	Yes
Occidental Petroleum	$1506	No
Oryx Energy	$ 175	No
Penn Central	$ 200	No
Pennzoil	$ 550	No

APPENDIX 4.1a (cont'd)

Firm Name	Face Value ($ millions)	Event Risk Covenant
Philip Morris	$1250	No
Pitney Bowes	$ 250	No
Potlatch Corporation	$ 100	Yes
Procter & Gamble	$ 150	No
Ralston Purina	$ 200	No
Rockwell International	$ 300	No
Rohm and Haas	$ 100	Yes
Safety-Kleen	$ 100	Yes
Sears Roebuck	$ 600	No
Sequa Corporation	$ 150	Yes
Sonat, Inc.	$ 100	No
Super Valu Stores	$ 45	Yes
Tenneco	$ 350	No
Texaco	$ 600	No
Texas Instruments	$ 150	No
Times Mirror Co.	$ 100	No
Union Camp	$ 100	Yes
United Technologies	$ 400	Yes *
VF Corporation	$ 200	Yes
Westvaco	$ 200	No
Xerox	$ 900	No

This column provides the $ face value of all fixed rate coupon bonds issued in 1989.

* A portion of the new issue bonds have event risk protection. In terms of $ face value, 71% of Anheuser-Busch's new issue bonds, 60% of Boise Cascade's new issue bonds and 75% of United Technologies' new issue bonds have event risk protection.

APPENDIX 4.1a (cont'd)

1990 Sample Firms

Firm Name	Face Value ## ($ millions)	Event Risk Covenant
Alcan Aluminum	$ 500	No
Anheuser-Busch	$ 100	No
Arco Chemical	$ 625	No
Arvin Industries	$ 50	No
Boise Cascade	$ 325	Yes
Burlington Resources	$ 300	No
Campbell Soup	$ 100	No
Capital Cities/ABC	$ 250	No
Caterpillar	$ 300	No
Champion International	$ 350	No
Chesapeake Corporation	$ 55	No
Coastal Corporation	$ 250	No
Coca Cola	$ 250	No
Comdisco	$ 200	No
Conagra	$ 400	No
Cyprus Minerals	$ 150	Yes
Dayton Hudson	$ 650	No
Dillard Dept. Stores	$ 50	No
Dow Chemical	$ 200	No
Dupont de Nemours	$ 600	No
Eastman Kodak	$ 750	No
Exxon	$ 250	No
Ford Motor	$4202	No
General Electric	$1550	NO
General Motors	$2250	No
Georgia Pacific	$ 600	Yes
Home Depot	$ 200	No
International Paper	$ 400	Yes
ITT Corporation	$ 350	No
Johnson and Johnson	$ 250	No
Kimberly Clark	$ 100	No
May Dept. Stores	$ 325	No
Maytag	$ 200	Yes
McDonalds	$ 100	No
McGraw Hill	$ 250	No
Morrison Knudsen	$ 500	No
Morton International	$ 200	Yes
Nynex	$ 450	No
Occidental Petroleum	$ 150	No
Penn Central	$ 150	Yes
Penny (J.C.)	$ 500	No
Pennzoil	$ 250	No
Philip Morris	$1600	No
Phillips Petroleum	$ 300	No
Premark International	$ 100	No

APPENDIX 4.1a (cont'd)

Firm Name	Face Value ($ millions)	Event Risk Covenant
Rohm and Haas	$ 250	Yes
Scott Paper	$ 550	No
Sears Roebuck	$ 300	No
Tenneco	$ 325	No
Texaco	$ 400	No
Times Mirror	$ 100	No
TRW, Inc.	$ 100	No
Union Camp	$ 100	No
Union Pacific	$ 100	No
Unisys	$ 300	Yes
Unocal	$ 500	No
Wal Mart	$ 500	No
Westinghouse	$ 300	No
Westvaco	$ 200	No
Weyerhauser	$ 200	Yes
Whirlpool	$ 200	No
Xerox	$ 400	No

This column provides the $ face value of all fixed rate coupon bonds issued in 1990.

APPENDIX 4.2a

APPENDIX 4.2a

Sample Firm Insider Ownership Fractions

1989 Sample Firms

Firm Name	Insider Ownership	Other Signif. Ownership
AAR Corp	.066	.000
Alcan Aluminum	.003	.000
American Brands	.005	.000
Anadarko Petroleum	.020	.120
Anheuser-Busch	.130	.110
Arco Chemical	.005	.834
Arkla, Inc.	.015	.000
Ashland Oil	.020	.000
Baxter International	.022	.000
Becton Dickinson	.023	.000
Boise Cascade	.045	.000
Borden	.005	.000
Bowater	.005	.000
Caterpillar	.006	.000
Chrysler	.010	.000
Coastal Corporation	.054	.150
Deere & Co.	.006	.101
Dillard Dept. Stores	n.a.	n.a.
Dow Chemical	.014	.000
Dupont de Nemours	.220	.230
Eastman Kodak	.005	.000
Eaton Corporation	.010	.000
Exxon	.005	.000
Fleming Companies	.050	.000
Ford Motor Co.	n.a.	.000
General Electric	.005	.000
General Motors	.010	.000
Grumann Corporation	.020	.426
Home Depot	.140	.000
IBM	.006	.000
ITT Corporation	.005	.110
Knight-Ridder	.400	.000
Limited (The)	.360	.000
Lockheed Corporation	.017	.221
Loews Corporation	.240	.000
Lyondell Petrochemical	.005	.500
Maytag	.015	.000
McDonalds	.080	.000
Monsanto	.005	.000
Occidental Petroleum	n.a.	n.a.
Oryx Energy	.005	.260
Penn Central	.341	.000
Pennzoil	.030	.000

APPENDIX 4.2a (cont'd)

Firm Name	Insider Ownership	Other Signif. Ownership
Philip Morris	.005	.000
Pitney Bowes	.005	.000
Potlatch Corporation	.140	.000
Procter & Gamble	.122	.000
Ralston Purina	.070	.000
Rockwell International	.017	.000
Rohm and Haas	.470	.000
Safety-Kleen	.066	.123
Sears Roebuck	.005	.150
Sequa Corporation	.380	.000
Sonat, Inc.	.007	.114
Super Valu Stores	.014	.088
Tenneco	.010	.000
Texaco	.005	.000
Texas Instruments	.140	.000
Times Mirror Co.	n.a.	.000
Union Camp	.005	.000
United Technologies	.005	.080
VF Corporation	.005	.231
Westvaco	.050	.140
Xerox	.010	.000

APPENDIX 4.2a (cont'd)

1990 Sample Firms

Firm Name	Insider	Other Signif. Ownership
Alcan Aluminum	.002	.000
Anheuser-Busch	.130	.110
Arco Chemical	.005	.834
Arvin Industries	.170	.000
Boise Cascade	.045	.000
Burlington Resources	n.a.	n.a.
Campbell Soup	.580	.000
Capital Cities/ABC	.216	.000
Caterpillar	.006	.000
Champion International	.005	.000
Chesapeake Corporation	.182	.000
Coastal Corporation	n.a.	n.a.
Coca Cola	.050	.068
Comdisco	.300	.000
Conagra	.070	.000
Cyprus Minerals	.005	.280
Dayton Hudson	.005	.000
Dillard Dept. Stores	n.a.	n.a.
Dow Chemical	.014	.000
Dupont de Nemours	.220	.230
Eastman Kodak	.005	.000
Exxon	.005	.000
Ford Motor	n.a.	n.a.
General Electric	.005	.000
General Motors	.010	.000
Georgia Pacific	.020	.000
Home Depot	.140	.000
International Paper	.005	.000
ITT Corporation	.005	.110
Johnson and Johnson	.016	.086
Kimberly Clark	n.a.	n.a.
May Dept. Stores	n.a.	n.a.
Maytag	.080	.000
McDonalds	.010	.070
McGraw Hill	.060	.000
Morrison Knudsen	.030	.000
Morton International	.014	.000
Nynex	n.a.	n.a.
Occidental Petroleum	n.a.	n.a.
Penn Central	.349	.000
Penny (J.C.)	n.a.	n.a.
Pennzoil	.030	.000
Philip Morris	.005	.000
Phillips Petroleum	.190	.000

APPENDIX 4.2a (cont'd)

Firm Name	Insider	Other Signif. Ownership
Premark International	.025	.094
Rohm and Haas	.470	.000
Scott Paper	.014	.000
Sears Roebuck	.005	.160
Tenneco	.010	.000
Texaco	.005	.000
Times Mirror	n.a.	.000
TRW Inc.	.012	.000
Union Camp	.005	.000
Union Pacific	.010	.000
Unisys	.005	.000
Unocal	.090	.000
Wal Mart	.420	.000
Westinghouse	.005	.000
Westvaco	.050	.140
Weyerhauser	.077	.000
Whirlpool	.020	.000
Xerox	.010	.000

n.a. Either no information is available in Value Line regarding insider ownership fraction or the information provided is not comparable with the information provided for the other sample firms.

CHAPTER 5

Description of Variables Which Proxy for Agency Problems

This chapter presents the empirical model to be tested and describes how the independent variables used in this model are calculated. It also discusses the empirical methodology used in this research.

Chapter 3 examines theories and arguments which are useful in identifying firm characteristics which proxy for agency problems. The amount of free cash flow and future investment opportunities are identified as characteristics which proxy for agency problems of free cash flow. Leverage level is identified as a proxy for agency problems of debt. Firm size and the variability of analysts' earnings forecasts are identified as proxies for information asymmetry. Manager own-firm ownership stake is identified as a proxy for an agency problem related to manager entrenchment. This chapter describes how these characteristics are quantified in the independent variables.

5.1 Empirical Model

A cross-sectional logit regression is used to analyze the relation between agency problems and event risk covenant use. Equation (1) presents the logit model.

$$(1)\quad \ln(P_i)/(1-P_i) = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 OPPOR_i + \alpha_3 CASH_i + \alpha_4 INFOR_i + \alpha_5 NETDEBT_i + \alpha 6 YEAR_i + \alpha_7 FINSUB_i + \alpha_8 COMBIN_i$$

where

P_i	=	the probability that $COVPROT_i$ equals "1". $COVPROT_i$ is a binary variable which is coded "1" if $firm_i$ has issued one or more bonds with event risk protection and "0" otherwise.
$SIZE_i$	=	the size of $firm_i$.
$OPPOR_i$	=	future investment opportunities or growth prospects of $firm_i$.
$CASH_i$	=	the amount of free cash flow available to managers of $firm_i$.
$INFOR_i$	=	the severity of information asymmetry that characterizes $firm_i$.
$NETDEBT_i$	=	the leverage level of $firm_i$.
$YEAR_i$	=	a binary variable to indicate whether an observation is from 1989 or 1990. $YEAR_i$ is coded "1" if an observation is from 1989 and "0" if it is from 1990.
$FINSUB_i$	=	a binary variable to indicate whether a significant portion of the firm's assets support finance and/or insurance activities. $FINSUB_i$ is coded "1" if the firm has significant finance or insurance activities.
$COMBIN_i$	=	an interaction variable, $NETDEBT_i$ * $FINSUB_i$.

The model shown in equation (1) is a logit transformation of the logistic model. When the response variable is binary, several assumptions of ordinary least squares (OLS) regression are violated. Logistic regression

gets around the problems encountered with OLS. Appendix 5.1 discusses the problems encountered with OLS and how logistic regression overcomes them.

In the present analysis of event risk covenant use, a bond is categorized as having event risk protection if Standard and Poor's Corporation gives it a ranking of E-1, E-2, E-3 or E-4. A bond with no ranking or a ranking of E-5 is categorized as having no event risk protection. As stated previously, the levels of protection, as ranked by Standard and Poor's, are

E-1	Strong event risk protection;
E-2	Significant event risk protection;
E-3	Some event risk protection;
E-4	Weak event risk protection;
E-5	Insignificant event risk protection.

5.2 Independent Variables

5.21 Firm Size

Firm size is measured by the natural logarithm of the book value of firm total assets (Compustat item #6) at the fiscal year end prior to sample bond issuance. Natural logarithm of book value, rather than unadjusted book value of firm assets is used in order to minimize the effects of outlier firms on logit regression results. Panel A of Appendix 5.2 provides statistics on the firm size variable. A list of the five smallest and five largest observations is included.

Other empirical research uses a variety of proxies for

firm size. For example, Banz (1981) and Fama and French (1992) use market value of equity as a size proxy. These two studies relate firm size to the risk/return characteristics of equity. Barclay and Smith (1993) use the natural logarithm of the market value of firm total assets as a size proxy.[1] Malitz (1986) proxies for size with the natural logarithm of the book value of total assets in her research relating firm characteristics to the use of several bond covenants.

Book value is preferred to market value of assets in this research because it results in a size proxy which does not overlap with the variable which measures future investment opportunities of the firm. Market value of assets overlaps because it includes the expected value of future projects.

Total asset book value, instead of equity book value, is preferred as a size proxy in order to prevent leverage level from influencing the size measure. Leverage is measured with another variable.

As discussed in Chapter 3, results which provide support for the Costly Contracting Hypothesis show a negative relation between firm size and event risk covenant use. Small firms are likely to have relatively severe information asymmetry which is reduced by event risk

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[1]Barclay and Smith calculate the market value of total assets by subtracting book value of equity from book value of total assets and adding market value of equity to the resulting difference.

covenants.

5.22 Investment Opportunities

Quality of future investment opportunities is proxied for with the ratio of market value of common equity to book value of common equity (hereafter ME/BE). The numerator of this ratio takes into account the market consensus present value of expected future projects. It is calculated as closing stock price (Compustat item #24) multiplied by the number of common shares outstanding at year end (Compustat item #25). The denominator is total common equity (Compustat item #60). Data for the fiscal year end preceding sample bond issuance is used. Panel B of Appendix 5.2 provides statistics on the investment opportunity variable. A list of the five smallest and five largest observations is included.

ME/BE (or its reciprocal BE/ME) is used in other research as a measure of quality of investment opportunities. Fama and French (1992) state that "firms the market judges to have poor prospects, signaled here by low stock prices and high rates of book to market equity, have higher expected returns than firms with strong prospects." They do note, however, that BE/ME may just capture "the unraveling (regression toward the mean) of irrational market whims about the prospects of firms."

Barclay and Smith (1993) use a ratio of market value of total assets to book value of total assets (MA/BA) as a

proxy for investment opportunities or "growth options". This research looks at MA/BA in tests of robustness of the investment opportunity proxy variable. There is not a strong theoretical argument for favoring the use of assets over equity for this proxy.

Barclay and Smith (1993) also use earnings price ratio (E/P) and annual research and development expense divided by firm value as alternative proxies for future investment opportunities. They state that they expect firms with relatively few growth options to have high E/P and low research and development expenses.

Lehn and Poulsen (1989) use recent historical sales growth rates as proxies for future investment opportunities. They reason that if sales have been growing rapidly in the past 2-year or 4-year period, then it is probable that they will grow rapidly in the near future.

Lang, Stulz and Walkling (1991) use Tobin's q ratio to distinguish between firms that have positive net present value investment opportunities and those that do not. Tobin's q ratio is defined as the market value of a firm's assets to their replacement cost. They state that high q ratio firms are likely to have positive prospects.

Tobin's q ratio is a theoretically superior measure of future investment opportunities because replacement cost provides more information to decision-makers than book value. However, replacement cost is very difficult to measure and accounting data related to replacement cost is

not widely available for firms after 1987. Thus, ME/BE instead of Tobin's q ratio is used in this research.

Results which show that firms with poor investment prospects are more likely to use event risk covenants than firms with good investment prospects support the Costly Contracting Hypothesis.

5.23 Free Cash Flow

The free cash flow proxy variable used in this research is identical to that used by Lehn and Poulsen (1989). It is measured using data from the fiscal year end prior to sample bond issuance. Lehn and Poulsen's cash flow equation is shown in (2).

(2) CF = INC - TAX - INTEXP - PFDDIV - COMDIV

where

INC	=	operating income before depreciation, (Compustat item #13);
TAX	=	total income taxes, (Compustat item #16), minus change in deferred taxes from the previous year to the current year (change in Compustat item #35);
INTEXP	=	gross interest expense on short- and long-term debt (Compustat item #15);
PFDDIV	=	total amount of preferred dividend requirement on cumulative preferred stock and dividends paid on noncumulative preferred stock (Compustat item #19);
COMDIV	=	total dollar amount of dividends declared on common stock (Compustat item #21).

Lehn and Poulsen scale CF by market value of equity. Panel C of Appendix 5.2 provides statistics on the free cash flow variable.

Lang, Stulz and Walkling (1991) use Lehn and Poulsen's CF measure as a proxy for free cash flow. They scale CF by book value of total assets because "...depending on the stochastic process followed by cash flow, an increase in cash flow can increase, decrease or leave unchanged the ratio of cash flow to market value of equity." (P.319) Based on this reasoning, CF is scaled by book value of total assets in this paper.

Lehn and Poulsen's cash flow measure is appropriate for this research because it provides cash flow information after all payments to suppliers of capital have been made. The free cash flow problem refers to the propensity of managers to waste the residual or "free" cash flow rather than pay it out to shareholders.

Lehn and Poulsen's measure ignores cash flow distortions due to accrual accounting however. A measure suggested by Compustat appears to account for some effects of accrual accounting. This measure is calculated as income before extraordinary items plus depreciation and amortization and is scaled by book value of total assets.

As discussed in Chapter 3, according to Jensen's free cash flow theory, firms with relatively large amounts of free cash flow have severe agency problems between managers and owners and may lever up to decrease these agency problems. Results which show a systematic positive relation between the cash flow measure and event risk covenant use provide support for the Costly Contracting Hypothesis. They

also provide support for Jensen's free cash flow theory.

5.24 Information Asymmetry

The independent variable INFOR proxies for information asymmetry between firm insiders, such as managers, and firm outsiders, such as prospective bondholders. A cross-sectional standard deviation of IBES analysts' earnings forecasts is calculated for sample firms. The fiscal year for which data is obtained is the year which precedes sample firm bond issuance. The earnings forecasts used are those made six months before fiscal year end. Only new and newly-verified forecasts are included in the standard deviation calculation. For example, Anadarko Corporation issued a bond in 1989. Its fiscal year end occurs on December 31. The standard deviation of forecasts of 1988 year-end earnings which were made in June 1988 are calculated. If an Anadarko analyst does not submit a new forecast in June 1988 but verifies to IBES that his/her previous forecast still holds, the verified forecast is included in the standard deviation calculation.

The selection of forecasts made six months prior to fiscal year end as opposed to forecasts made earlier or later in the year is arbitrary. The objective of specifying a particular month from which forecasts are taken is to control for the resolution of uncertainty that occurs as an earnings announcement date approaches. For example, if Firm A's fiscal year ends July 31 and Firm B's fiscal year ends

December 31, and June forecasts are used for all sample firms, then Firm A's analysts would face less uncertainty than Firm B's analysts regarding the profitability of the current fiscal year.

The standard deviation of analysts' forecasts is scaled by fiscal year-end stock price. The mean earnings forecast is not appropriate as a scale factor because it may be equal to zero or a negative number or may vary systematically by industry, leading to a distortion of the measure of earnings variability. Panel E of Appendix 5.2 provides statistics on the information asymmetry variable.

The use of this proxy variable assumes that variability of forecasts can be attributed to information asymmetry. To the extent that other factors contribute to the variability of forecasts, this proxy variable will be of limited usefulness.

Malitz (1986) uses firm size, measured as total asset book value, as a proxy for information asymmetry. As stated previously, size is used in this research as a proxy for information asymmetry as well as a measure of risk.

It is expected that firms with severe problems of information asymmetry use event risk covenants more frequently than firms with less severe problems of information asymmetry. Thus, INFOR is expected to be positively related to the use of event risk covenants.

5.25 Leverage

Firm debt level is measured by Bruner's (1988) net debt ratio in which debt is reduced by the cash and near-cash assets of the firm. Consideration of cash and near-cash assets provides a clearer picture of the firm's bankruptcy risk. The net debt ratio is calculated as follows:

Net Debt Ratio = Net Debt/(CS + PS + Net Debt)

where

Net Debt	=	book value of long-term debt (Compustat item #9) plus book value of short-term debt (Compustat item #34) less cash and short-term investments (Compustat item #1);
CS	=	common stock market value (Compustat item #24 multiplied by item #25);
PS	=	preferred stock book value (Compustat item #130).

Panel D of Appendix 5.2 provides statistics on the net debt ratio.

Bruner (1988) also looks at a traditional debt ratio in order to test the robustness of his findings. The debt ratio is calculated as follows:

Debt Ratio = Debt/(CS + PS + Debt)

where

Debt	=	book value of long-term debt plus book value of short-term debt (as calculated above);
CS	=	as above;
PS	=	as above.

This research also uses the traditional debt ratio in robustness tests.

Theory tells us that firms with high debt ratios have relatively severe agency problems of debt. Thus it is expected that there is a positive relation between event risk covenant use and debt ratio.

5.26 Financial Subsidiary Indicator

This binary variable indicates whether a sample firm has a substantial financial subsidiary. The line of business description in Moody's Industrial Manual is examined to determine if financing activities are one of the firm's main activities. If financing activities are one of the firm's main activities, then FINSUB equals one. Otherwise it equals zero.

The presence of substantial finance operations at some firms may decrease comparability among sample firms. FINSUB is included in the model to capture systematic influences due to differences in industrial and financial operations.

Many firms have finance subsidiaries which are not a major part of their business. A variation of the logit model sets FINSUB equal to one if the firm has a finance subsidiary, regardless if it is a major part of the firm's business or not. Finance subsidiaries are identified using lists of subsidiaries found in Moody's Industrial Manual.

5.27 Interaction between Leverage and Financial Subsidiaries

COMBIN is an interaction variable between FINSUB and DEBT. It is used to determine if there is a systematic

relation between debt ratio and event risk covenant use for firms which have substantial finance subsidiaries.

Finance companies are characterized by higher debt ratios than non-finance companies. The presence of these firms in the sample could obscure the relation between debt ratio and event risk covenant use in nonfinancial companies.

5.3 Empirical Methods

The logistic model in equation (1) is estimated using the method of maximum likelihood. The principle of maximum likelihood estimation (MLE) is to choose a set of coefficient estimates that "imply the highest probability or likelihood of having obtained the observed sample Y." (Aldrich and Nelson, p. 51, 1984) Appendix 5.1a shows how maximum likelihood estimates are calculated. An Iteratively Reweighted Least Squares (IRLS) algorithm is used to solve the log likelihood equation. Wald chi square statistics are calculated and used in tests of the null hypotheses that the individual coefficients equal zero. The Wald chi square statistic is calculated as the square of the coefficient estimate divided by its variance estimate.

Coefficient estimates reflect the effect of a change in an independent variable on the logarithm of the odds ratio, $\log[P_i/(1-P_i]$. The effect of a change in an independent variable on P_i is not constant since the relation between a given variable and event risk covenant use is not linear.

APPENDIX 5.1a

APPENDIX 5.1a

LOGIT REGRESSION

A. Why Ordinary Least Squares Regression is Inappropriate

The empirical analysis in this research is concerned with factors affecting the decision to use or not use an event risk covenant. The dependent variable is qualitative with two possible outcomes.

Ordinary least squares regression (hereafter OLS) is inadequate for estimating parameters when the dependent variable is qualitative because the error terms have undesirable properties. Specifically, if we assume that

$$E(y_i) = Pr[Y_i=1] = \boldsymbol{x}_i'\boldsymbol{\beta}$$

then the probability that y_i equals one is unbounded and may be outside the unit interval. Also, since y_i can only take two values then e_i can only take two values.

$$e_i = [1-\boldsymbol{x}_i'\boldsymbol{\beta}]$$

with probability

$$\boldsymbol{x}_i'\boldsymbol{\beta}$$

when $y_i = 1$

and

$$e_i = -\boldsymbol{x}_i'\boldsymbol{\beta}$$

with probability

$1-x_i'\beta$

when $y_i = 0$

With this probability structure e_i is heteroskedastic.

$$var(e_i) = E[y_i](1-E[y_i])$$

Thus, OLS produces unbiased but not best coefficient estimates. Hypotheses tests of the coefficients will be invalid.

B. Binary Choice Model Appropriate for this Research

In this research we are modeling choice behavior of managers/firms in determining whether or not to use event risk covenants. Each dependent variable observation has a Bernoulli distribution.

$$f(y_i) = (P_i)^{y_i}(1-P_i)^{1-y_i}$$

A particular probability distribution for e_i must be chosen. The most common choices are the normal and logistic distributions. The logistic distribution is chosen here.[2] The logistic CDF is

[2]The choice of the logistic distribution is arbitrary. Aldrich and Nelson (1984) note that "the logistic and normal curves are so similar as to yield essentially identical results." (p.34)

$$F(t) = \frac{1}{1+\exp(-t)}$$

The logistic random variable variance is

$$\sigma^2 = \frac{\pi^2}{3}$$

The logistic distribution is symmetric with zero mean. Choice of the logistic distribution for e_i results in the logit statistical model. Logit leads to probabilities that are confined to the 0,1 interval.

C. Parameter Estimation

The object of estimation is a vector of unknown parameters, ß. Maximum likelihood estimation is used to estimate ß in cases where there is one decision per individual decision maker. With T independent observations, the joint probability or likelihood function is

$$L = \prod_{(i=1)}^{T} f(y_i) = \prod_{(i=1)}^{T} P_i^{y_i}(1-P_i)^{1-y_i}$$

$$= \prod_{(i=1)}^{T} F(\boldsymbol{x}_i'\boldsymbol{\beta})^{y_i}[1-F(\boldsymbol{x}_i'\boldsymbol{\beta})]^{1-y_i}$$

where F(.) is the logistic CDF and y_i = 1 if alternative 1 is chosen but 0 otherwise.

$$\ln L = \sum_{(i=1)}^{T} y_i \ln F(\mathbf{x}_i'\boldsymbol{\beta}) + \sum_{(i=1)}^{T} (1-y_i) \ln [1-F(\mathbf{x}_i'\boldsymbol{\beta})]$$

The above equation must be maximized using numerical methods because the first order derivatives are highly nonlinear functions of ß and cannot be solved directly. (Judge, et al, 1988)

APPENDIX 5.2a

APPENDIX 5.2a

APPENDIX 5.2a

INFORMATION ON INDEPENDENT VARIABLES

This appendix presents statistics on the independent variables from equation (1) which proxy for agency problems.

$$(1)\quad \ln(P_i)/(1-P_i) = \alpha_0 + \alpha_1 SIZE_i + \alpha_2 OPPOR_i + \alpha_3 CASH_i + \alpha_4 INFOR_i + \alpha_5 NETDEBT_i + \alpha 6 YEAR_i + \alpha_7 FINSUB_i + \alpha_8 COMBIN_i$$

where

P_i	=	the probability that $COVPROT_j$ equals "1". $COVPROT_i$ is a binary variable which is coded "1" if $firm_i$ has issued one or more bonds with event risk protection and "0" otherwise.
$SIZE_i$	=	the size of $firm_i$.
$OPPOR_i$	=	future investment opportunities or growth prospects of $firm_i$.
$CASH_i$	=	the amount of free cash flow available to managers of $firm_i$.
$INFOR_i$	=	the severity of information asymmetry that characterizes $firm_i$.
$NETDEBT_i$	=	the leverage level of $firm_i$.
$YEAR_i$	=	a binary variable to indicate whether an observation is from 1989 or 1990. $YEAR_i$ is coded "1" if an observation is from 1989 and "0" if it is from 1990.
$FINSUB_i$	=	a binary variable to indicate whether a significant portion of the firm's assets support finance and/or insurance activities. $FINSUB_i$ is coded "1" if the firm has significant finance or insurance activities.
$COMBIN_i$	=	an interaction variable, $NETDEBT_i$ * $FINSUB_i$.

APPENDIX 5.2a (cont'd)

Panel A **LNASSET**

The natural logarithm of total asset book value is calculated as a measure of firm size (SIZE).

N	124	Maximum Value	12.063
Mean	8.899	Quartile 3	9.763
Std. Dev.	1.329	Median	8.804
		Quartile 1	7.850
		Minimum	5.876

Smallest Firms:

5.876	AAR Corp *
5.988	Safety Kleen *
6.550	Home Depot
6.587	Morrison Knudsen
6.672	Chesapeake Corp

Largest Firms:

11.762	General Electric
11.873	Ford Motor (1989)
11.988	Ford Motor (1990)
12.008	General Motors (1989)
12.063	General Motors (1990)

Firms missing this data item:

Conagra

* This firm has event risk protection.

APPENDIX 5.2a (cont'd)

Panel B ME/BE

A ratio of the market value of equity to the book value of equity is used as a proxy for future investment opportunities.

N	124	Maximum Value	6.406
Mean	2.045	Quartile 3	2.450
Std. Dev.	1.088	Median	1.812
		Quartile 1	1.307
		Minimum	0.722

Firms with the smallest ME/BE ratios:

0.722	General Motors (1989)
0.736	General Motors (1990)
0.792	Chrysler
0.826	Arvin Industries
0.826	Grumann Corp *

Firms with the largest ME/BE ratios:

4.767	Johnson & Johnson
5.163	Limited (The)
5.491	Home Depot
6.147	Ralston Purina *
6.406	Walmart Stores

Firms missing this data item:

Conagra

* This firm has event risk protection.

APPENDIX 5.2a (cont'd)

Panel C CFAST

Lehn & Poulsen's free cash flow measure, scaled by book value of assets, is used here as a proxy for free cash flow.

N	122	Maximum Value	0.191
Mean	0.077	Quartile 3	0.108
Std. Dev.	0.045	Median	0.080
		Quartile 1	0.047
		Minimum	- 0.064

Firms with the smallest CFAST values:

-0.064	Texaco
-0.043	Oryx Energy
-0.035	Unisys *
-0.026	Tenneco
0.002	Penn Central *

Firms with the largest CFAST values:

0.1598	Cyprus Minerals *
0.1607	Bowater *
0.1742	Limited (The)
0.1751	Dow Chemical
0.1912	Pennzoil

Firms missing this data item:

Sears (1989)
Conagra
Sears (1990)

* This firm has event risk protection.

APPENDIX 5.2a (cont'd)

Panel D NET DEBT

Bruner's net debt ratio is used to measure leverage.

N	**123**	**Maximum Value**	**0.8095**
Mean	**0.2871**	**Quartile 3**	**0.4303**
Std. Dev.	**0.2259**	**Median**	**0.2685**
		Quartile 1	**0.1728**
		Minimum	**-0.5203**

Firms with the smallest NET DEBT ratios:

-0.520	Penn Central *
-0.486	Penn Central *
-0.323	Pennzoil
-0.252	Loews
-0.036	Texas Instruments

Firms with the largest NET DEBT ratios:

0.748	Comdisco
0.762	General Motors (1989)
0.763	General Motors (1990)
0.781	Ford Motor (1990)
0.809	Chrysler

Firms missing this data item:

Conagra
Arkla

* This firm has event risk protection.

APPENDIX 5.2a (cont'd)

Panel E INFOR

A scaled standard deviation of IBES analysts' forecasts is used to measure information asymmetry.

N	122	Maximum Value	0.0488
Mean	0.0072	Quartile 3	0.0088
Std. Dev.	0.0083	Median	0.0052
		Quartile 1	0.0025
		Minimum	0.0005

Firms with the smallest INFOR measures:

.000472	Johnson & Johnson
.000676	Procter & Gamble
.000706	McDonalds
.000791	General Electric
.000825	Wal Mart

Firms with the largest INFOR measures:

.022339	Alcan Aluminum *
.035146	Chrysler
.045641	General Motors
.047396	Cyprus Minerals
.048805	General Motors

Firms missing this data item:

Oryx
Lyondell Petrochemical
Sequa
Morton International

* This firm has event risk protection.

CHAPTER 6

Discussion of Results

The empirical tests of this research examine the relation between agency problems and event risk covenant use in order to distinguish between two competing hypotheses described by Smith and Warner (1979):

1. The Irrelevance Hypothesis
2. The Costly Contracting Hypothesis

Results which show no systematic relation between agency problems and event risk covenant use provide support for the Irrelevance Hypothesis. Irrelevance is the null hypothesis of this research. Results which show that firms with severe agency problems of free cash flow, debt and information asymmetry are likely to use event risk covenants provide support for the Costly Contracting Hypothesis.

More specifically, the Costly Contracting Hypothesis is supported by the following:

1. a positive relation between amount of free cash flow (CASH) and event risk covenant use;
2. a negative relation between future investment opportunities (OPPOR) and event risk covenant use;
3. a positive relation between leverage (NETDEBT) and event risk covenant use;
4. a negative relation between firm size (SIZE) and event risk covenant use;
5. a positive relation between analysts' earnings forecast variability (INFOR) and event risk covenant use;

Column 1 of Table 6.1 presents a summary of results which support the Costly Contracting Hypothesis.

TABLE 6.1

SUMMARY OF PREDICTIONS OF THE COSTLY CONTRACTING HYPOTHESIS AND THE MANAGER ENTRENCHMENT THEORY[a]

	THEORIES	
Variable[b]	(1) Costly Contracting	(2) Manager Entrenchment
CASH	(+) Jensen (1986)	
OPPOR	(-) Jensen (1986)	
NETDEBT	(+) Jensen & Meckling (1976)	
SIZE	(-) Barnea, Haugen & Senbet (1980)	
INFOR	(+) Barnea, Haugen & Senbet (1980)	
INSIDER OWNERSHIP		(-) Shleifer & Vishny (1989)
		(-) Morck, Shleifer & Vishny (1988)

[a] + (-): A positive (negative) relationship between event risk covenant use and the variable.

[b] CASH = Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets) as a proxy for free cash flow;
OPPOR = ratio of market value of equity to book value of equity as a proxy for future investment opportunities;
NETDEBT = Bruner's (1988) net debt ratio as a proxy for leverage;

TABLE 6.1 (Cont'd)

SIZE	natural log of total assset book value as a proxy for information asymmetry;
INFOR	scaled cross-sectional standard deviation of IBES analysts' earnings forecasts as a proxy for information asymmetry;
INSIDER OWNERSHIP	insider ownership fraction as published by Value Line Investment Survey as a proxy for manager ownership stake;

An alternative explanation for event risk covenant use is that managers use them to entrench themselves. The managerial entrenchment argument is supported by results which show a negative relation between manager own-firm ownership fraction and event risk covenant use.

6.1 Empirical Results

Table 6.2 presents the maximum likelihood coefficient estimates and p-values for equation (1). Regression (a) shows results for the full sample. Regression (b) shows results for a subset which excludes 1990 observations of firms which issue bonds in both 1989 and 1990. In other words, each firm is observed only once in the two-year study period in the subset.

The null hypothesis that the coefficient on SIZE is equal to zero is rejected. Small firms in the sample are more likely to issue bonds with event risk covenants than large firms. This is consistent with a hypothesis that firms with relatively severe information asymmetry are more likely to use event risk covenants than the average firm.

Firm size may proxy for other risk factors in addition to (or instead of) information asymmetry. In this context, the results of regression (a) may indicate that the most risky firms use event risk covenants.

Future investment opportunities, as proxied for by OPPOR, are significantly (p-value is .0285) and negatively related to the probability of event risk covenant use.

TABLE 6.2

Logistic Regression Coefficients[a]
Base Model

Independent Variable	(a) Main Sample (n = 121)	(b) 1 obsv per firm[b] (n = 92)
Intercept	5.6411 (.0244)**	3.8777 (.1393)
SIZE	-0.8868 (.0010)***	-0.7440 (.0060)***
OPPOR	-0.6586 (.0285)**	-0.4808 (.1375)
CASH	12.7473 (.0482)**	14.3751 (.0407)**
NETDEBT	3.0153 (.0875)*	3.2067 (.0967)*
FINSUB	1.0927 (.2767)	-0.5842 (.7293)
COMBIN	-5.8681 (.0348)**	-2.1502 (.5691
YEAR	0.9290 (.0703)*	1.0306 (.0859)*

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

[b] All 1990 observations are excluded for firms which issue bonds in both 1989 and 1990.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.2 (cont'd)

Independent Variable Descriptions

SIZE	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
NETDEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, DEBT * FINSUB;
YEAR	a binary variable to indicate whether a sample observation is from 1989 or 1990. Year = "1" if sample observation is from 1989 and "0" if from 1990.

The free cash flow proxy variable is positive and significant (p-value is .048). These results are consistent with Jensen's free cash flow theory.

The coefficient on NETDEBT is significant at the 10% level (p-value is .0875) with a positive sign. As agency problems of debt increase, event risk covenant use increases.

The presence of finance subsidiaries at some sample firms complicates interpretation of the net debt coefficient. Firms with substantial finance subsidiaries, as defined in section 5.26, are denoted with an indicator variable, FINSUB. This variable is insignificant, showing that the presence of a substantial finance subsidiary does not systematically influence the likelihood of event risk covenant use.

COMBIN examines the influence of the net debt ratio of finance subsidiaries on event risk covenant use. The COMBIN coefficient is significant and has a negative sign, showing that firms which lever up through finance subsidiaries are less likely to use event risk covenants than other sample firms.

The variable YEAR, coded "1" if the observation is from 1989 and "0" if it is from 1990, is positive and significant. The likelihood that a firm included an event risk covenant in its bond indenture was higher in 1989.

Overall, the results for the logit regression specified in equation (1) provide support for the Costly Contracting

Hypothesis. They show that firms with the most severe agency problems of free cash flow are most likely to use event risk covenants. There is also evidence that firms with severe agency problems of debt, as indicated by high net debt ratios, are likely to use event risk covenants during the sample period. And finally, there is some evidence, as indicated by the size variable, that firms with severe agency problems of information asymmetry are likely to use event risk covenants during the sample period.[1]

In regression (b) each firm is observed once over the two year sample period. Omitting 1990 observations for firms which issue bonds in both 1989 and 1990 reduces the sample size from 121 observations to 92 observations.[2]

The coefficients on SIZE, CASH, NETDEBT and YEAR in regression (b) are significantly different from zero and have the same signs as in regression (a). The coefficients on OPPOR and COMBIN, however, are not significantly different from zero in regression (b). The similarity between the coefficients estimated by regressions (a) and (b) provides evidence that the empirical results are fairly robust to changes in sample selection criteria.

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[1]Convertible bonds are described as "bullish" event risk provisions in Bicksler and Chen (1992). Four convertible bonds are in the main sample. Omitting convertible bonds does not change the results of the logit regression specified by equation (1).

[2]The largest sample firms tend to be the ones issuing bonds in both 1989 and 1990. Therefore, the largest sample firms have less influence in regression (b).

The insignificant coefficient on COMBIN is explained by noting that most of the firms with substantial finance subsidiaries are large and issued bonds in both years. These firms are observed in both 1989 and 1990 in regression (a) but only in 1989 in regression (b). When their influence is reduced, COMBIN becomes insignificant.

Table 6.3 shows the results of regressions (c) and (d). They are the same as (a) and (b) except that an additional proxy variable for information asymmetry, INFOR, is included in the model. The null hypothesis that the coefficient on INFOR is equal to zero cannot be rejected. Either information asymmetry has no systematic influence on event risk covenant use or INFOR is not a good proxy.

Robustness tests are performed on SIZE, OPPOR, CASH and NETDEBT. The results of these tests are presented and discussed in Appendix 6.1. The firm size and future investment opportunity variables are robust to changes in how they are measured. The free cash flow and leverage measures are not very robust.

TABLE 6.3

Logistic Regression Coefficients[a]
Information Asymmetry Proxy Variable Included

Independent Variable	(c) Main Sample (n = 118)	(d) 1 obsv per firm[b] (n = 89)
Intercept	4.5016 (.0853)*	2.5738 (.3576)
SIZE	-0.7998 (.0029)***	-0.6562 (.0170)**
OPPOR	-0.5184 (.1189)	-0.3417 (.3353)
CASH	11.3349 (.1032)*	13.4892 (.0803)*
INFOR	11.1748 (.7899)	11.9989 (.7704)
NETDEBT	3.3394 (.0738)*	3.7282 (.0797)*
FINSUB	0.9595 (.3518)	-0.5401 (.7470)
COMBIN	-7.0636 .0249**	-3.3711 (.4048)
YEAR	1.0654 (.0458)**	1.2125 (.0562)*

The dependent variable is $\ln [p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

[b] All 1990 observations are excluded for firms which issue bonds in both 1989 and 1990.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.3 (cont'd)

Independent Variable Descriptions

SIZE	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
INFOR	standard deviation of IBES analysts' annual earnings forecasts scaled by year-end stock price;
NETDEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, DEBT * FINSUB;
YEAR	a binary variable to indicate whether a sample observation is from 1989 or 1990. Year = "1" if sample observation is from 1989 and "0" if from 1990.

6.2 "Substantial" Finance Subsidiaries Versus All Finance Subsidiaries

The FINSUB variable in regressions (a) - (d) is coded "1" if the sample firm has a "substantial" financial subsidiary and "0" if it does not.[3] In regressions (e) and (f), shown in Table 6.4, I examine whether it is important to distinguish between the presence of any finance subsidiary and a "substantial" finance subsidiary. Regression (f) is different from (e) in that all finance subsidiaries are coded "1" for the variable FINSUB instead of just the "substantial" finance subsidiaries. COMBIN is insignificant in (f). The probability of event risk covenant use is affected by the debt levels of firms with large finance subsidiaries but not by the debt levels of firms with small finance subsidiaries. This result verifies that it is worthwhile to distinguish between finance subsidiaries which heavily influence the nature of the firm's operations and finance subsidiaries which are insignificant.

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[3]As stated in section 5.26, a "substantial" finance subsidiary is one which is mentioned in the Moody's Industrial Manual description of a firm's line of business.

TABLE 6.4

Logistic Regression Coefficients[a]
Variations related to Finance Subsidiaries

Independent Variable	(e) Main Sample (Substantial Subs Only)[b] (n = 121)	(f) Main Sample (All Finance Subs)[c] (n = 121)
Intercept	6.3179 (.0106)	4.8156 (.0587)
SIZE	-0.9035 (.0008)***	-0.7394 (.0064)***
OPPOR	-0.6601 (.0202)**	-0.5195 (.0832)*
CASH	13.4901 (.0381)**	13.6557 (.0467)**
NETDEBT	2.6324 (.1353)	2.5535 (.1614)
FINSUB	1.1497 (.2714)	-0.1585 (.9211)
COMBIN	-5.3188 (.0557)*	-2.4809 (.5007)

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

[b] A sample firm has a "substantial sub" if its finance subsidiary is mentioned in the line of business description found in Moody's Industrial Manual.

[c] Many sample firms have finance subsidiaries which are not part of their main business activities. These firms are coded as having finance subsidiaries along with the firms which have "substantial subs" in this regression.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.4 (cont'd)

Independent Variable Descriptions

SIZE	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
NETDEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a finance subsidiary;
COMBIN	an interaction variable, DEBT * FINSUB;

6.3 Model Specification

Analysis of model specification is useful in determining if a missing variables problem exists. Table 6.5 presents a series of logit regressions in which independent variables are added one by one. Regression (g) shows the results if firm size is the only independent variable. The null hypothesis that SIZE is insignificant is rejected. The SIZE coefficient is negative and significant. Regression (h) includes the firm size variable and the investment opportunity variable. Again the SIZE coefficient is negative and significant and the investment opportunity proxy is negative and significant at the 5% level. Regression (i) shows results when the cash flow variable is added. Size and opportunity variables remain negative and significant and the cash flow variable has a positive coefficient sign but is insignificant at the 5% level (p-value = .1053). Regression (j) shows results when the net debt variable is added. The signs and significance levels of the previously-added variables are essentially unchanged. The net debt variable is insignificant (p-value = .7473). Regression (k) shows results when the variable which indicates whether an observation is from 1989 or 1990 is added. This variable equals "1" if the observation is from 1989. The YEAR coefficient is positive and has a p-value of .1351. The other variables are essentially unchanged. Regression (l) shows the addition of the variable which indicates if there is a significant finance subsidiary and

TABLE 6.5

Logistic Regression Coefficients[a]
Variations in Model Specification

Independent Variable	(g) (n = 121)	(h) (n = 121)	(i) (n = 121)
Intercept	6.3053 (.0009)***	8.4102 (.0001)***	7.1732 (.0019)***
SIZE	-0.8539 (.0002)***	-0.9574 (.0001)***	-0.8811 (.0003)***
OPPOR		-0.6194 (.0244)**	-0.6981 (.0132)**
CASH			9.0030 (.1053)*
NETDEBT			
YEAR			
FINSUB			
COMBIN			

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.5 (cont'd)

Independent Variable Descriptions

SIZE	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
NETDEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
YEAR	a binary variable to indicate whether a sample observation is from 1989 or 1990.
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, DEBT * FINSUB;

TABLE 6.5 (cont'd)

Logistic Regression Coefficients[a]
Variations in Model Specification

Independent Variable	(j) (n = 121)	(k) (n = 121)	(l) (n = 121)
Intercept	7.2133 (.0019)***	6.7313 (.0038)***	5.6411 (.0244)**
SIZE	-0.9019 (.0004)***	-0.8951 (.0004)***	-0.8868 (.0010)***
OPPOR	-0.6868 (.0157)**	-0.6729 (.0232)**	-0.6596 (.0285)**
CASH	9.2370 (.1008)*	8.5400 (.1295)	12.7473 (.0482)**
NETDEBT	0.3739 (.7473)	0.5372 (.6470)	3.0153 (.0875)*
YEAR		0.7293 (.1351)	0.9290 (.0703)*
FINSUB			1.0927 (.2767)
COMBIN			-5.8681 (.0348)**

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.5 (cont'd)

Independent Variable Descriptions

SIZE	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
NETDEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
YEAR	a binary variable to indicate whether a sample observation is from 1989 or 1990.
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, DEBT * FINSUB;

and also the addition of the interaction variable between FINSUB and net debt level. When the interaction variable is added to the regression, the cash flow variable becomes significant at the 5% level and the net debt variable becomes significant at the 10% level and has a positive sign. The interaction variable has a negative sign and is significant at the 5% level. This result is explained by the fact that the largest firms in the sample often have substantial finance subsidiaries and relatively high leverage. Large firms seldom use event risk covenants. When the model controls for firms with high debt levels due to finance subsidiaries, the relation between event risk covenant use and net debt level is revealed.

6.4 Empirical Test of a Managerial Entrenchment Motive for Event Risk Covenant Use

Table 6.6 compares results for regressions (m) and (n). Regression (m) is the original model. The insider ownership variable is added to the original model in (n). This new variable is used to test manager entrenchment as a motive for event risk covenant use. The coefficient is insignificant. Thus no support is provided for the idea that managers with low own-firm ownership fractions use event risk covenants to reduce the likelihood of a hostile takeover.

TABLE 6.6

Logistic Regression Coefficients[a]
Insider Ownership Variable Included

Independent Variable	(m) (n = 121)	(n) (n = 109)
Intercept	6.3179 (.0106)**	6.2150 (.0132)
SIZE	-0.9035 (.0008)***	-0.8594 (.0017)***
OPPOR	-0.6601 (.0202)**	-0.6515 (.0210)**
CASH	13.4901 (.0381)**	11.2949 (.0750)*
DEBT	2.6324 (.1353)	2.2159 (.2046)
FINSUB	1.1497 (.2714)	0.7757 (.4553)
COMBIN	-5.3188 (.0557)*	-4.6065 (.0915)*
INSIDER OWNERSHIP		1.2226 (.5245)

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.6 (cont'd)

Independent Variable Descriptions

SIZE	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
NETDEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, DEBT * FINSUB;
INSIDER OWNERSHIP	insider ownership fraction as published in the Value Line Investment Survey.

6.5 Summary of Results

The results of this empirical analysis provide support for the Costly Contracting Hypothesis. Specifically, they show a systematic relation between severity of agency problems related to free cash flow and debt and event risk covenant use. Firms with excess free cash flow, few investment opportunities, and relatively high leverage are more likely to use event risk covenants than other firms in the sample. These results are fairly robust to changes in sample selection criteria and very robust to changes in how firm size and future investment opportunities are measured.

Model specification tests do not show signs of a missing variable problem. They do show, however, that firm leverage is related to event risk covenant use only if the high leverage of firms with large finance subsidiaries is controlled for.

Finally, no systematic relation between insider ownership fraction and event risk covenant use is found. Managerial entrenchment as an alternative explanation for event risk covenant use is not supported by the empirical results.

APPENDIX 6.1a

APPENDIX 6.1a

Robustness Tests for Independent Variables

TABLE 6.1a

Logistic Regression Coefficients[a]
Tests of Size Variable Robustness

Indep. Var.	(1a) 121	(2a) n=121	(3a) n=121	(4a) n=121	(5a) n=121
Intrcpt	6.3179 (.0106)**	6.4692 (.0092)***	5.5504 (.0199)**	5.6419 (.0152)**	3.7568 (.0839)*
LNASSET	-0.9035 (.0008)***				
LNMVAST		-0.9370 (.0007)***			
LNEQBV			-0.8891 (.0015)***		
LNEQMV				-0.9282 (.0010)***	
LNSALES					-0.6276 (.0076)***
OPPOR	-0.6601 (.0202)**	-0.4354 (.1143)	-0.7106 (.0129)**	-0.3129 (.2524)	-0.5611 (.0448)**
CASH	13.4901 (.0381)**	13.5973 (.0360)**	14.8860 (.0210)**	14.7135 (.0219)**	14.6572 (.0187)**
DEBT	2.6324 (.1353)	2.4560 (.1532)	1.7525 (.2991)	1.6709 (.3145)	2.4830 (.1461)
FINSUB	1.1497 (.2714)	1.0714 (.3031)	0.8856 (.3771)	0.7917 (.4275)	0.9145 (.3541)
COMBIN	-5.3188 (.0557)*	-5.1878 (.0602)*	-5.0740 (.0568)*	-4.9396 (.0608)*	-5.2010 (.0480)**

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

TABLE 6.1a (con't)

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

Independent Variable Descriptions

LNASSET	natural log of total asset book value;
LNMVAST	natural log of total asset market value;
LNEQBV	natural log of equity book value;
LNEQMV	natural log of equity market value;
LNSALES	natural log of annual sales revenue;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
INFOR	standard deviation of IBES analysts' annual earnings forecasts scaled by year-end stock price;
DEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, $DEBT_i$ * $FINSUB_i$;

APPENDIX 6.1a (cont'd)

TABLE 6.1b

Logistic Regression Coefficients[a]
Tests of Investment Opportunity Variable Robustness

Independent Variable	(1b) n=121	(2b) n=121	(3b) n=118	(4b) n=86	(5b) n=120
Intercept	6.3179 (.0106)	8.2419 (.0035)	3.4069 (.1459)	8.6568 (.0094)	1.7642 (.4971)
LNASSET	-0.9035 (.0008)***	-0.9940 (.0004)***	-0.7519 (.0035)***	-1.3014 (.0007)***	-0.5479 (.0574)*
ME/BE	-0.6601 (.0202)**				
MA/BA		-1.7550 (.0136)**			
GRORAT2			2.3666 (.1701)		
R&D				36.7066 (.0149)**	
E/P					365.0000 (.0486)**
CASH	13.4901 (.0381)**	14.2332 (.0304)**	10.4515 (.1281)	1.5227 (.8641)	10.2137 (.1325)
DEBT	2.6324 (.1353)	2.2140 (.2002)	3.7603 (.0496)**	4.9921 (.0655)*	2.7016 (.1524)
FINSUB	1.1497 (.2714)	1.0625 (.3154)	1.1310 (.2844)	1.4955 (.2374)	0.8723 (.3987)
COMBIN	-5.3188 (.0557)*	-5.1714 (.0635)*	-7.1700 (.0206)**	-6.1840 (.0850)*	-6.0492 (.0390)**

The dependent variable is $\ln[p_i/(1-p_i)]$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

TABLE 6.1b (cont'd)

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

Independent Variable Descriptions

LNASSET	natural log of total asset book value;
LNMVAST	natural log of total asset market value;
LNEQBV	natural log of equity book value;
LNEQMV	natural log of equity market value;
LNSALES	natural log of annual sales revenue;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
INFOR	standard deviation of IBES analysts' annual earnings forecasts scaled by year-end stock price;
DEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, $DEBT_i$ * $FINSUB_i$;

APPENDIX 6.1a

TABLE 6.1c

Logistic Regression Coefficients[a]
Tests of Cash Flow Variable Robustness

Independent Variable	(1c) n=121	(2c) n=121	(3c) n=121
Intercept	6.3179 (.0106)	7.8314 (.0007)	6.6835 (.0061)
LNASSET	-0.9035 (.0008)***	-0.9691 (.0003)***	-0.9545 (.0003)***
ME/BE	-0.6601 (.0202)**	-0.6503 (.0224)**	-0.6483 (.0247)**
CFAST	13.4901 (.0381)**		
CFEQ		2.0957 (.2098)	
CF-TRAD			10.7148 (.1207)
DEBT	2.6324 (.1353)	1.5340 (.2949)	2.4482 (.1821)
FINSUB	1.1497 (.2714)	0.6460 (.5266)	1.1073 (.3162)
COMBIN	-5.3188 (.0557)*	-4.3645 (.1018)	-4.4869 (.1064)

Dependent variable is $p_i/(1-p_i)$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.1c (cont'd)

Independent Variable Descriptions

LNASSET	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
CFEQ	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of equity);
CF-TRAD	income before extraordinary items plus depreciation and amortization scaled by book value of total assets;
DEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, $DEBT_i$ * $FINSUB_i$;

APPENDIX 6.1a

TABLE 6.1d

Logistic Regression Coefficients[a]
Tests of Debt Variable Robustness

Independent Variable	(1d) n=121	(2d) n=121	(3d) n=121
Intercept	6.3179 (.0106)	6.2454 (.0103)	6.7452 (.0057)
LNASSET	-0.9035 (.0008)***	-0.8882 (.0009)***	-0.8295 (.0017)***
ME/BE	-0.6601 (.0202)**	-0.6135 (.0375)**	-0.7131 (.0120)**
CFAST	13.4901 (.0381)**	12.0050 (.0517)*	10.2035 (.0972)*
NET DEBT	2.6324 (.1353)		
TRAD DEBT		2.1899 (.3248)	
INT COV			-0.0051 (.9382)
FINSUB	1.1497 (.2714)	0.5622 (.5551)	0.4211 (.6466)
COMBIN	-5.3188 (.0557)*	-3.6616 (.1203)	-2.5529 (.2163)

Dependent variable is $p_i/(1-p_i)$ where p_i is the probability that firm i issues a bond or bonds with significant event risk protection.

[a] The p-values of logistic regression coefficients are listed in parentheses below the coefficients.

*** Coefficient is significant at the 1% level.
** Coefficient is significant at the 5% level.
* Coefficient is significant at the 10% level.

TABLE 6.1d (cont'd)

Independent Variable Descriptions

LNASSET	natural log of total asset book value;
OPPOR	ratio of market value of equity to book value of equity;
CASH	Lehn and Poulsen's (1989) cash flow measure (scaled by book value of total assets);
NET DEBT	Bruner's (1988) net debt ratio where net debt is defined as short-term debt plus long-term debt less cash and cash equivalents;
TRAD DEBT	Traditional debt ratio is defined as short-term debt plus long-term debt divided by total asset book value;
INT COV	after-tax interest coverage is calculated as income before extraordinary items plus interest expense divided by interest expense;
FINSUB	a binary variable to indicate whether the firm has a "substantial" finance subsidiary;
COMBIN	an interaction variable, $DEBT_i$ * $FINSUB_i$;

APPENDIX 6.1a (cont'd)

Discussion of Robustness Tests

Table 6.1a provides tests of the robustness of the firm size variable. Regression (1a) presents the original model for comparison purposes. The original model uses the book value of firm total assets as a size proxy. Regressions (2a) through (5a) show alternative size proxies. The alternative measures, market value of total assets, book value of equity, market value of equity, and sales revenue, have been used in other studies and are discussed in Chapter 5 of this paper.

All of these firm size variables are significant at the 1% level. The regressions with size measures which consider market value of assets or equity ((2a) and (4a)) have insignificant investment opportunity variables. This is because market values consider future investment opportunities. Overall, the size variable is very robust.

Table 6.1b shows tests of robustness of the investment opportunity variable. The original proxy variable, shown in (1b), is calculated as market value of equity divided by book value of equity (ME/BE). Other measures include a ratio of market value of assets to book value of assets, a 2-year historical growth rate, research and development expense scaled by total asset book value, and an earnings price ratio.

All of the investment opportunity proxy variables are

significant at the 5% level except 2-year historical growth rate. The results for the investment opportunity proxy variable in regression (4b) are based on only 86 observations because of a lack of availability of research and development expense data. This reduces the comparability of regression (4b) with the other regressions. The results in Table 6.1b show that the results related to the investment opportunity variable are quite robust.

Cash flow variable robustness is tested by the regressions shown in Table 6.1c. The first regression, (1c), has Lehn and Poulsen's (1989) cash flow measure scaled by book value of total assets. Regression (2c) scales Lehn and Poulsen's measure by book value of equity, instead of book value of total assets. The change in scale factor causes cash flow to be insignificant and the debt p-value to increase from .1353 to .2949. Theoretically, there is no strong preference for book value of assets over book value of equity as a scale factor. Book value of assets may be slightly better because it prevents the cash flow measure from being affected by changes in leverage.

Regression (3c) measures cash flow as income before extraordinary items plus depreciation and amortization scaled by book value of total assets. This measure is recommended by Compustat and factors in the effect of accrual accounting better than the Lehn and Poulsen measure. However it is not a free cash flow measure because dividends are not subtracted. Results show that this variable has a

positive coefficient and a p-value of .1207. The other coefficients are not significantly changed when this cash flow measure is used. The alternative cash flow proxies are not as robust as the size and investment opportunity variables. Table 6.1d shows results of tests of debt variable robustness. Regression (1d) is the original model. The leverage measure is Bruner's (1988) net debt ratio. Net debt is defined as short-term debt plus long-term debt less cash and cash equivalents. In regression (2d) a traditional debt ratio replaces the net debt ratio. The traditional debt ratio does not consider cash balances. The resulting coefficient is insignificant. In regression (3d) an after-tax interest coverage ratio replaces the net debt ratio. This alternative proxy variable is insignificant. Overall, the leverage measure is not robust to changes in how it is calculated. The implication of this finding is that we must be certain that the leverage proxy variable is calculated in a way that is consistent with relevant theory.

CHAPTER 7

Covenant Set Evaluations

This chapter focuses on the overall covenant sets of sample firms and examines how event risk covenants fit into this overall set.[1] Section 7.1 provides background information on the relation between bondholder covenant protection and wealth losses due to leverage-increasing events. Section 7.2 describes the empirical analysis of sample firm covenant sets. The empirical results are discussed in section 7.3.

7.1 Background Information

Asquith and Wizman (1990) examine bond prospectuses provided by Disclosure and Moody's Industrial Manual and classify bond covenant protection as "strong", "weak" or "no protection" in their study of the bondholder wealth effects of LBOs.[2] They find that bondholders, on average, have

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[1]"Overall covenant set" includes all the covenants of the firm's bonds.

[2]Asquith and Wizman (1990) classify bond covenant protection as follows:

Strong Protection
1. all bonds with a net worth restriction on the surviving firm in a merger;
or 2. all bonds that limit total funded debt;

Weak Protection
none of the strong protection covenants but
1. covenants limiting senior funded debt;
or 2. restricting dividends or special payouts to shareholders from retained earnings;

abnormal returns of -2.8% for the period from two months preceding the buyout announcement until two months after the buyout is completed, for successful buyouts. When results are examined based on classification of covenant protection, however, bondholders with "strong" covenant protection have abnormal returns of +2.1%. Bondholders with "weak" or "no protection" have returns of -2% and -5.3%, respectively. These results imply that traditional bond covenants protect bondholders from wealth losses due to a leverage-increasing event.

Asquith and Wizman (1990) note that the use of traditional protective covenants decreased dramatically after 1980. For example, they find that for their sample bonds issued before 1980, 75% of A-rated prebuyout corporate bonds had covenant restrictions on both additional debt financing and future dividend payouts. After 1980, only 8% of A-rated bonds had both types of restrictions. They do not offer an explanation for the decrease in covenant use in the 1980's.

7.2 Empirical Analysis of Covenant Sets

The information on bond covenants provided by Moody's Industrial Manual (1992) is used to evaluate each sample

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No Protection
none of the above listed covenants

firm's bond covenant protection.[3] All coupon bonds issued between January 1, 1985 and June 30, 1992 are evaluated.

The first step in the evaluation process is to divide the bonds into three groups:

1. Bonds issued in the period **before** event risk covenants became popular (January 1985 - December 1988).
2. Bonds issued **during** the period when event risk covenants were popular (January 1989 - December 1990).
3. Bonds issued **after** the period when event risk covenants were popular (January 1991 - June 1992).

The bonds are then categorized by whether or not they are issued by firms which use event risk covenants during 1989 or 1990. Thus, there are six groups of bonds.

For every bond issued by a sample firm in one of the three time periods specified above, information regarding the covenant restrictions is recorded on the worksheet shown in Appendix 4.3. The worksheet records information about the presence of traditional covenants, call and put provisions, sinking funds, sale-leaseback provisions, event risk covenants. It also records whether or not a bond is convertible.

Only seven bonds out of a total of 484 have a limit on future payouts. Three of these bonds were issued in the pre-event risk covenant years and four were issued during

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[3]Asquith and Wizman compare the covenant descriptions in Moody's Industrial Manual with the covenants in the actual bond prospectuses obtained from Disclosure. They report that Moody's Industrial Manual is incomplete or inaccurate for 21% of the bonds they examine. Therefore, the information obtained and analyzed in this chapter must be interpreted cautiously.

the event risk covenant years (1989 and 1990) by firms which did not use event risk covenants. None of the bonds have restrictions on total debt or senior funded debt. Covenants which put net worth restrictions on the surviving firm in a merger are not seen.[4]

The bonds issued by sample firms in the specified periods almost always have sale-leaseback covenants and limitations on additional secured debt. These covenants offer little protection from wealth losses due to leverage-increasing events.

The number of bonds with original maturities greater than or equal to seven years which have call provisions, sinking funds, put provisions, and are convertible are counted for each time period for both the group of firms with event risk protection and the group without event risk protection.[5] Tables 7.1 and 7.2 present the numbers (and percentages) of bonds with the above features.

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[4]Asquith and Wizman (1990) note that Moody's Industrial Manual does not report on this covenant. Therefore, I cannot report on whether or not it is being used by the sample firms.

[5]A seven year original maturity is specified in order to increase comparability between the three time periods. If a five year time period is used, then the results from the earliest period are inaccurate because 5-year maturity bonds issued in 1985 or 1986 would have already matured.

TABLE 7.1

Data on Firms Which Have Event Risk Protection in Bond Indentures During Sample Period (1989 - 1990)

	1985 - 1988	1989 - 1990	1991 - 6/1992
Total Number of Bonds Issued[a]	70	56	43
Number (%) of Bonds With Call Provision	52 (74%)	16 (28.5%)	6 (14%)
Number (%) of Bonds With Sinking Funds	19 (27%)	6 (11%)	2 (4.5%)
Number (%) of Putable Bonds	2 (3%)	3 (5.5%)	0 (0%)
Number (%) of Convertible Bonds	3 (4.5%)	6 (11%)	2 (4.5%)

[a] Bonds included have an original maturity of 7 years or greater. No variable rate bonds or zero coupon bonds are included.

TABLE 7.2

Data on Firms Which Do Not Have Event Risk Protection in Bond Indentures During Sample Period (1989 - 1990)

	1985 - 1988	1989 - 1990	1991 - 6/1992
Total Number of Bonds Issued[a]	133	87	95
Number (%) of Bonds With Call Provision	91 (68.5%)	17 (19.5%)	14 (14.5%)
Number (%) of Bonds With Sinking Funds	41 (31%)	4 (4.6%)	7 (7.5%)
Number (%) of Putable Bonds	10 (7.5%)	4 (4.6%)	3 (3%)
Number (%) of Convertible Bonds	2 (1.5%)	2 (2.3%)	2 (2%)

[a] Bonds included have an original maturity of 7 years or greater. No variable rate bonds or zero coupon bonds are included.

7.3 Discussion of Results

Results show that the use of call provisions has decreased in both the firms with event risk protection and the firms without event risk protection. However, the use of call provisions has decreased less for the firms with event risk provisions. The use of sinking funds has decreased over time and the decrease is approximately equal for both the firms with event risk protection and those without. The use of put provisions is low for both groups of firms.

More firms in the group with event risk protection during the sample period issue convertible bonds. And the use of convertible bonds was heaviest during the period when event risk covenants were used. This is not surprising, since convertible bonds have been referred to as "bullish" event risk protection. (Bicksler and Chen, 1990)

Overall, the results provide further evidence for the Costly Contracting Hypothesis. Previous results of this research show that firms with severe agency problems are likely to use event risk covenants. This section shows that the firms that use event risk covenants during the study period also use call provisions and make their bonds convertible more often than firms that do not use event risk covenants.

CHAPTER 8

Conclusion

8.1 Summary of Results

The empirical results of this paper help explain differences in debt contracts across firms. Firms with severe agency problems of free cash flow, as indicated by relatively large amounts of free cash flow and few investment opportunities, are more likely to use event risk covenants than other firms during the sample period. Also, firms with severe agency problems of debt, as indicated by a high net debt ratio, are more likely to use event risk covenants than other firms during the sample period.

Tests of the relation between information asymmetry and event risk covenant use provide some support for the hypothesis that event risk covenants increase firm value in the presence of severe information asymmetry. Firm size, a proxy for information asymmetry, is very significantly related to event risk covenant use. However, variability of analysts' earnings forecasts, another proxy for information asymmetry, is not systematically related to event risk covenant use.

This research finds no empirical support for the hypothesis that managers use event risk covenants to entrench themselves. Insider ownership fraction and event risk covenant use are not systematically related.

Analysis of the covenant sets of the sample bonds shows

that event risk covenants do not replace any covenants used immediately before their advent. However, they appear to replace the traditional protective covenants that were used frequently prior to 1980. Event risk covenants have been used infrequently since the end of 1990 and no other covenants appear to be taking their place.

Firms that use event risk covenants also issue bonds with call provisions and convertible bonds more frequently than firms that do not use event risk covenants. This is consistent with the argument that firms with severe agency problems use complex contracts to maximize firm value.

8.2 Implications of Results

The empirical results of this research imply that event risk covenants help maximize firm value when agency problems are severe. This is consistent with the Costly Contracting Hypothesis. Interestingly, event risk covenant use is shown to be related to the severity of agency problems of equity as well as debt. Thus, this research provides insight into the interaction between manager/stockholder conflicts and debt contracts.

Recent research (Asquith and Wizman, 1991) has shown that the traditional covenants used in the 1970's are effective in protecting bondholders from wealth losses due to leverage-increasing events. The fact that firms use event risk covenants even though traditional covenants are effective suggests that event risk covenants are less

costly.

Event risk covenants were used frequently during 1989 and 1990 and seldom after 1990. Two possible explanations of why event risk covenant use dramatically declined after 1990 are listed below:

1. the covenants were a gimmick or fad created by investment bankers and did not work better than market forces in reducing agency problems.
2. the covenants are only useful in an economic environment characterized by very high corporate debt levels and heavy takeover activity. (Agency problems related to event risk are most severe in this environment.)

The empirical findings of Crabbe (1991), that event risk covenants are priced by the market, and of this research, that there is a systematic relation between firms with severe agency problems and event risk covenant use, provide support for the second explanation. Also, economic conditions that prevailed in the late 1980's and early 1990's are consistent with the second explanation. Kaplan and Stein (1993) examine how leveraged buyouts evolved through the 1980's. They document a number of changes in buyout characteristics toward the late 1980's. Two findings that are relevant to event risk covenant use are:

1. "As prices rose, buyouts were undertaken in riskier industries, and with somewhat higher leverage ratios."
2. "...management and other interested parties such as investment bankers and deal promoters took more money up front out of the later deals." (p. 317)

These findings indicate that the LBOs of the late 1980's and 1990 were riskier for bondholders than earlier LBOs. Agency problems related to potential claim dilution and bankruptcy

were more severe. Also, there was a greater risk incentive problem since managers held a smaller equity stake. Thus it is not surprising that event risk covenants appeared when they did.

In 1990, several events occurred that help explain the near-disappearance of event risk covenants. Drexel Burnham Lambert, the largest provider of LBO financing declared bankruptcy in early 1990. The U.S. economy went into recession in mid-1990. The demise of Drexel and the increased risk aversion brought about by the economic downturn helped cause a dramatic decrease in leveraged buyout activity. LBO volume fell to less than $4 billion in 1990 after peaking at greater than $60 billion in 1988. (Kaplan and Stein, 1993)

Event risk covenant use increased during the time period when the riskiest buyouts were being undertaken. It decreased when buyout activity dropped off precipitously. Thus, changes in LBO activity offer an explanation of why event risk covenants were heavily used for a short period and then declined.

The above discussion of explanation two implies that prospective bondholders are concerned about event risk in the current environment only. Many of the bonds with event risk covenants have a time to maturity of ten to thirty years. What about the next period of heavy takeover activity? It is possible that only the near future is relevant because the present value of future expected losses

due to leverage-increasing events is small.

The implication for corporate managers and bond investors is that event risk covenants are not necessarily obsolete. It is possible that they represent a value-maximizing way of controlling the stockholder-bondholder conflict under specific economic conditions.

8.3 Possible Extensions of this Research

An interesting extension of this research would involve analysis of how conflicts between managers and stockholders have affected bond contracts in the past. The Costly Contracting Hypothesis predicts a systematic relation between firms with severe agency problems of free cash flow and the use of traditional bond covenants.

Another extension of this research would involve following sample firms and periodically analyzing their bond covenant sets. This analysis would provide information on how bond covenant sets are evolving. It would also provide information on whether or not the sample firms are continuing to use event risk covenants.

Finally, a third extension of this research would involve examining the characteristics of the six sample firms which use event risk covenants in 1991 and 1992. Further insight into why bond contracts differ between firms may be obtained through analysis of the characteristics of these firms.

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