

Managerial Ownership, Takeover Defenses, and Debt Financing

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Abstract

We examine the impact of agency conflicts on firms' debt financing decisions and show that managerial equity ownership and its interaction with takeover defenses affect these decisions. Specifically, we find that (i) the relation between leverage and takeover defenses becomes insignificant when we control for the interaction of these defenses with managerial ownership, and (ii) firms with large managerial ownership operate at high levels of debt, unless these firms have a large number of takeover defenses, in which case managers reduce debt levels. Overall, the evidence suggests that a two-dimensional aspect of governance that includes the interaction between managerial ownership and takeover defenses is useful in understanding the impact of agency conflicts on firms' debt financing decisions.

JEL Classification: G31, G32, G34

Keywords: corporate control, managerial ownership, financing policy, leverage, cost of debt

I. Introduction

Recent theoretical research suggests that the empirical irregularities observed in the cross-section of U.S. firms regarding their financing decisions can be explained by gauging the impact of agency conflicts among the firm's stakeholders (managers, stockholders, and bondholders).¹ The severity of these conflicts typically increases when managers have discretion over financing policies and when they follow personal objectives (Jensen (1986) and Grossman and Hart (1982)). Yet, Jensen (1993) argues that management is often reluctant to make changes to reduce these agency conflicts. In such instances where internal control mechanisms fail to address agency related issues, investors rely on external control mechanisms to redirect management towards optimal behavior. Therefore, the tradeoff between the market for corporate control and managerial opportunism affects the financing policy of the firm (Zwiebel (1996)).

In this paper, we address how the interaction between takeover defenses and managerial ownership relate to firms' debt financing decisions. We posit that how managers decide on debt levels depends not only on the managerial holdings but also on the use of takeover defenses. The literature provides ample evidence with mixed results. For example, Stulz (1988) suggests that with increasing managerial voting rights, the probability of takeover decreases and takeover premium increases.² Similarly, Hartzell, Ofek, and Yermack (2004) show that as managerial holdings increase, CEOs have strong negotiation power in takeovers, which they use for their private benefits. Garvey and Hanka (1999) find that firms protected by second generation antitakeover state laws reduce their use of debt and suggest that impediments to takeovers induce a shift from debt to equity financing. Berger, Ofek, and Yermack (1998) show that corporate executives tend to use debt more aggressively when faced with control threat. Zwiebel (1996) argues that although employing debt restricts managers and leads to a loss of entrenchment, managers find it useful to employ debt to avert control challenge.

Alternatively, there is some contrary evidence that entrenched managers alter their capital structure by taking on more debt or by selling equity. John and Litov (2006) provide indirect evidence that firms with entrenched managers or weak shareholder rights use more debt in their capital structure. They argue that firms with weak shareholder rights assume sub-optimally

¹ See Jensen and Meckling (1976), Myers (1977) and Jensen (1986).

² Stulz, however, does not consider the impact of takeover defenses and suggests that it would be interesting as future research to consider the case in which management can increase its bargaining power by adopting an antitakeover measure such as a poison pill.

conservative (or safe) investment policies and as such would benefit from higher leverage. On the equity side, Cheng, Nagar, and Rajan (2005) posit that corporate control considerations play an important role in managers' stockholding. They find that managers directly reduced their ownership stakes after the passage of antitakeover laws by selling their stock. Overall, the evidence suggests that the level of managerial holdings and takeover defenses should be considered collectively while examining firms' debt financing policies.

Using an index of antitakeover provisions as in Gompers, Ishii, and Metrick (2003) (hereafter labeled, GIndex) as a measure of takeover defenses, we present evidence that firms with high GIndex carry more leverage, supporting Jiraporn and Gleason (2007), Wald and Long (2007) and John and Litov (2006). Moreover, we find that firms' leverage decisions are statistically and economically significantly related to the interaction of managerial holdings with this index. Our evidence shows that, in the presence of strong takeover defenses, managers with large equity ownership become entrenched and operate at lower levels of debt. When takeover defenses are not strong, however, these managers operate at higher levels of debt, supporting the hypothesis that they want to avert control threat or increase takeover premium by increasing leverage. Another interesting finding is that the use of antitakeover provisions does not affect firm leverage per se; rather its interaction with managerial ownership that matters. The evidence suggests that firm leverage decisions are related to the managerial holdings and the interaction of these holdings with takeover defenses, but not to takeover defenses per se.

Furthermore, we consider these governance structures in relation to the cost of debt financing. Cremers, Nair, and Wei (2006) and Klock, Mansi, and Maxwell (2005) examine the relation between the GIndex and bond yield spreads, and find that firms with a large number of antitakeover amendments enjoy lower costs of debt financing. The literature on cost of debt financing, however, does not explicitly investigate the interaction between managerial holdings and antitakeover provisions. To address this issue, we examine the impact of antitakeover provisions, managerial ownership, and their interaction on the cost of debt by controlling for the effects of these governance mechanisms on leverage. We find that managerial holdings do not affect yield spreads in most cases. Blockholders, on the other hand, have a negative relation with yield spreads when the firm has a large number of antitakeover provisions; evidence consistent with Cremers, Nair and Wei (2006).

For completeness, we further examine the impact of managerial ownership and takeover defenses on firms' leverage decisions and the cost of debt financing in the presence of bond covenants and the maturity structure of corporate debt. We find that bond covenants provide a moderating role for yield spreads. We also find that the covenants and their interaction with governance variables do not affect firms' debt levels in most cases.

II. Hypotheses

A. Managerial ownership, takeover defenses and leverage

The literature provides evidence that agency conflicts among the firm's three main stakeholders (managers, stockholders, and bondholders) affect firm financing policies (Myers (1977), Jensen and Meckling (1976) and Jensen (1986)). These agency conflicts can be mitigated by a variety of governance mechanisms, one of which is managerial ownership. The relation between leverage and managerial ownership, however, is closely linked to the market for corporate control (i.e., takeover market) through takeover defenses. Therefore, we examine the impact of governance mechanisms on leverage from a two-dimensional perspective, i.e. through how the interaction of managerial ownership and takeover defenses affect leverage decisions of the firms.

Morck, Shleifer, and Vishny (1988) and Stulz (1988) find that ownership below a certain limit decreases entrenchment because of the closer alignment between shareholders and managers. Beyond a certain limit, however, managerial entrenchment increases with ownership since managers can exert control on their own. Furthermore, Agrawal and Nagarajan (1990) compare all equity firms with levered firms and find a negative relation between managerial ownership and leverage. Berger, Ofek, and Yermack (1997) also find that leverage decreases with managerial ownership.

The relation of leverage with managerial ownership is also closely related to the takeover market. Hartzell, Ofek, and Yermack (2004) show that as managerial holdings increase, CEOs have strong negotiation power in takeovers, which they use for their private benefits. Berger, Ofek, and Yermack (1998) find that corporate executives tend to use debt more aggressively when faced with a control threat. The relation between corporate capital structure and agency conflicts are explicitly examined in the theoretical models of Zwiebel (1996) and Morellec (2004). Both Zwiebel and Morellec show that capital structure decisions depends on the tradeoff between the empire building desires of managers and the aim to prevent control challenges. When a firm does not have strong

takeover defenses, managers are exposed to control threats. When managerial ownership is high, as documented by Morck, Shleifer, and Vishny (1988) and Stulz (1988), managerial entrenchment increases as corporate executives have more control power. Although entrenched managers would prefer to operate at lower debt levels, both Zwiebel and Morellec show that these managers commit to higher debt levels such as not to excessively deviate from value maximization in order to prevent a control challenge. This theoretical literature suggests that when managerial ownership is large, and the firm does not have strong takeover defenses, managers can increase debt levels to avert takeover threat. Thus our first hypothesis is:

H1: The relation of leverage with managerial ownership is nonlinear. When managerial ownership is not large, firms operate at lower debt levels. When managerial ownership is large and the firm does not have strong takeover defenses, managers operate at higher debt levels.

Garvey and Hanka (1999) find that firms protected by second generation antitakeover state laws reduce their use of debt. Contrarily, Jiraporn and Gleason (2007), Wald and Long (2007), and John and Litov (2006) show a positive relation between leverage and an antitakeover index for firms that are incorporated in states with strong antitakeover laws. Stulz (1988) suggests that with increasing managerial voting rights, the probability of takeover decreases and takeover premium increases. Therefore, when a firm has strong takeover defenses and managers have large ownership, debt is not as crucial to prevent takeovers or to increase takeover premium. Thus, entrenched managers may prefer to operate at lower debt levels. When managerial ownership is not large, however, the direction of the relation between leverage and ownership becomes an empirical question. Therefore, the next two hypotheses are:

H2: When managerial ownership is large and the firm has strong takeover defenses, managers operate at lower debt levels.

H3: When managers do not have large ownership and the firm has strong takeover defenses, managers operate at a debt level that depends on the financing policy of the firm.

Bond covenants may reduce agency conflicts between managers and bondholders. Therefore, we examine the impact of bond covenants on leverage in relation to managerial ownership and takeover

defenses. Bond covenants protect bondholders and therefore can reduce the cost of debt financing, but it does not have an effect on the alliance of managers and shareholders. If firms are able to issue more debt by reducing debt-financing costs through covenants, then bond covenants can lead to higher debt levels. Bond covenants such as poison put, leverage restriction, and net worth restriction, on the other hand, can affect the amount of debt firms employ as well as how managers act when there is a control threat. Poison put covenant, for example, increases the cost of a takeover. Also, firms may not be able to issue more debt when net worth and leverage restriction covenants become binding. Yet, when takeover defenses are weak, entrenched managers can still issue debt to avoid control threats unless leverage and net worth restriction covenants are binding. When takeover defenses are strong, this time, entrenched managers prefer to operate at lower debt levels as in free cash flow hypothesis. In this case, bond covenants will not be limiting leverage decisions. Therefore, our fourth hypothesis is related to the impact of debt covenants on firm leverage. That is,

H4: (a) If reduced financing costs through bond covenants lead to a preference towards debt financing, then leverage increases with bond covenants.

(b) Otherwise, bond covenants should not have a significant effect on debt levels in most cases. Specifically:

- If takeover defenses are weak, entrenched managers can issue debt (as in hypothesis H1) until leverage and net worth restrictions become binding. Thus, bond covenants in most cases should not affect debt levels.
- If managerial ownership is large and firms have strong takeover defenses, managers prefer to operate at lower debt levels (as in hypothesis H2). Therefore bond covenants should not have an impact on leverage.
- If managerial ownership is not large, i.e. when it is below a certain limit where managers and shareholders are aligned, managers act on behalf of shareholders (as in hypothesis H3). Thus bond covenants should not affect debt levels unless shareholders and bondholders are not aligned.

B. Managerial ownership, takeover defenses and cost of debt financing

The cost of debt financing is closely related to the agency conflicts as well as the amount of leverage a firm employs. Therefore, we examine how bondholders decide on bond yield spreads in relation to managerial ownership and takeover defenses of a firm, controlling for the effect of these governance mechanisms on leverage. The impact of takeover defenses on yield spreads is examined in the literature (e.g. Klock, Mansi, and Maxwell(2005)). Yet the impact of managerial ownership as well as the impact of a two dimensional governance mechanism (managerial ownership and takeover defenses) on cost of debt financing is not analyzed.

Cremers, Nair, and Wei (2006) and Klock, Mansi, and Maxwell (2005) examine the relation between the Gompers, Ishii, and Metrick (2003) Index and bond yield spreads, and find that firms with strong takeover defenses have lower costs of debt financing. These studies suggest that the presence of takeover defenses prevents shareholder opportunism, which leads to a reduction in the bondholder-shareholder conflict reflected in lower costs of debt financing.

If managerial ownership below a certain limit proxies for good governance as in Morck, Shleifer, and Vishny (1988) and Stulz (1988), then it should have a positive impact on bond prices (lower yield spreads).³ On the other hand, when managerial ownership is large, entrenched managers and bondholders can be aligned. This can happen through two channels. When takeover defenses are weak, both will prefer to avert control threat. When takeover defenses are strong, entrenched managers prefer to operate at lower debt levels. In these cases, bondholders can reduce cost of debt financing for firms where managers have large ownership. On the other hand, managers that do not have large ownership, i.e. managers that are not entrenched, act on behalf of shareholders. Therefore, they may not act to prevent takeovers or can issue more debt depending on the financing policy of the firm. Thus bondholders can increase the cost of debt financing for these firms.

H5: If bondholders reward good governance (i.e. firms with managerial ownership below a certain limit) and punish entrenched managers with large holdings, then cost of debt financing decreases with managerial ownership up to a certain point and increases afterwards.

³ However, according to Morck, Shleifer, and Vishny (1988) and Stulz (1988), above a certain limit (generally 5%) managers become entrenched.

H6: If bondholders and entrenched managers with large ownership are aligned, then bondholders reduce cost of debt financing for these firms. Also, in this case, bondholders increase cost of debt financing for firms with lower managerial ownership when takeover defenses are weak.

Bond covenants should have a strong impact on the cost of debt financing because they are designed to protect bondholders. Therefore, we analyze how bond covenants affect yield spreads in relation to managerial ownership and takeover defenses. Cremers, Nair, and Wei (2006) find that yield spreads are lower for firms with bond covenants. Furthermore, they find that the impact of takeover defenses on yield spreads are reduced with the existence of bond covenants. That is,

H7: The cost of debt financing is negatively related to bond covenants.

III. Data Description

A. Data Sources

We utilize six databases in our analysis: the Investor Responsibility Research Center (IRRC) corporate governance database, the Lehman Brothers Fixed Income (LBFI) database, the Fixed Income Securities (FISD) database, the COMPUSTAT industrial database for firm characteristics, the CRSP database (for price and return information), and the Thomson Financial institutional and insider ownership database. In addition, because the Lehman Brothers bond department did not provide bond data beyond 1998, we manually collect traded bond data from Mergent's Bond Record (formerly Moody's) for the years 1999 and 2000.

The IRRC database provides annual data for the years 1990, 1993, 1995, 1998 and 2000, on shareholder rights (antitakeover provisions) for about 1,500 firms (primarily drawn from the S&P 500, and other large corporations) derived from proxy statements, annual reports, SEC filings such as 10-Ks and 10-Qs. Gompers, Ishii, and Metrick (2003) construct an index, referred to hereafter as GIndex, based on five governance rules and twenty-four provisions from the IRRC database. These rules include: delay, protection, voting, state, and other. The delay rules contain four provisions designed to slowdown a hostile bidder. The protection rules contain six provisions designed to

insure officers and directors against liability, or compensate them following termination. The voting rules contain six provisions related to stockholder rights in election. The state rules contain provisions designed to protect firms in certain states. The remaining six provisions not included in the above rules are included in the other group category. The index is constructed using a point scale from one to twenty four. The index with highest value has the largest number of antitakeover amendments, and the index with the lowest value has the smallest number of amendments.

The LBFI database provides month-end security specific information such as bid price, accrued interest, coupon, yield, credit ratings from S&P and Moody's, duration, convexity, quote, issue, and maturity dates on nonconvertible bonds that are included in the Lehman Brothers bond indexes. Bonds are included in the database based on firm size, liquidity, credit ratings, maturity, and trading frequency. The database contains data on over 10,000 traded bonds from 1990 to 1998 and is commonly used in the fixed income literature. Although the database does not contain the universe of traded debt, we have no reason to suspect any systematic bias within the sample.

The FISD provides information on debt covenants for corporate bond issues. The data start from 1994 through 2000. For each issue, we develop an index of three bond covenants (CovIndex) as in Cremers, Nair, and Wei (2006) to proxy for the severity of the bondholder-shareholder conflict. These include: leverage restriction covenants, net worth restriction covenants, and poison put covenants. We add one point for each covenant for the maximum value of 3 and a minimum value of zero for the index. For firms with multiple issues, a weighted value is provided for each issue with the weight being the fraction of the amount outstanding for the debt issue divided by the total amount outstanding for all bonds. The Thomson Financial Institutional Holdings database provides quarterly reports on ownership derived from the SEC's 13F filings. Each institution is classified as one of five types: bank, insurance, investment, independent investment advisor, and other. The database covers the period from 1980 to present, and provides data on insider holdings using reports on SEC forms 3, 4, 5, and 144. Data coverage is from 1986 to present.

For a firm-year observation to be included in our analysis, data must be present in the IRRC dataset to construct the GIndex. For missing years, we follow Gompers, Ishii, and Metrick (2003) and Bebchuk and Cohen (2005) and fill the missing years by the previous value of the GIndex that is available in that year. For example, for the year 1991, the data used is that from 1990. Information on the market value of equity, total assets, sales, and long term debt must be available in the COMPUSTAT database. Utilities and financials are excluded (SIC codes 4900-4999 and 6000-6999)

because of their treatment of liabilities. Merging the databases and applying these requirements yields a data set of 11,011 firm-year observations on 1828 firms for the period from 1990 to 2000. We use this dataset to analyze the leverage decisions of the firms. In order to examine cost of debt financing, data must be provided in the Lehman Brothers database on the amount, yield, price, and age of the firm's non-provisional publicly traded debt. Merging the database used for leverage regressions with this database lead to 2,570 firm-year observations on 533 firms for the period from 1990 to 2000 that is used in yield spread regressions. All variables are winsorized at the 0.5% level in the tails of the distribution.

B. *Measuring Firm Leverage and Cost of Debt Financing*

The dependent variables used for this research are: the market value of firm leverage (Leverage) and the cost of debt financing (Spread). We measure the market value of firm leverage as the ratio of the book value of long-term debt (COMPUSTAT data #9) to the market value of assets (market value of equity (data #199*data #25) plus current liabilities (data #34) plus long term debt (data #9) plus preferred liquidation value (data #10) plus deferred taxes and investment tax credit (data #35)). That is

$$Leverage = \frac{Long\ Term\ Debt}{Market\ Value\ of\ Assets} \quad (1)$$

The cost of debt financing, or yield spread (Spread), is measured as the difference between the yield to maturity on a publicly traded corporate debt (YTM_{CB}) and the yield to maturity on its duration equivalent Treasury (risk-free) security (YTM_{RF}). That is,

$$Spread = YTM_{CB} - YTM_{RF} \quad (2)$$

The yield on a corporate debt security is defined as the discount rate that equates the present value of the future cash flows to the security price. The yields on Treasury securities are constant maturity series published by the Federal Reserve Bank of New York in its H15 release. In cases where there is no equivalent Treasury maturity, the yield is computed using the Nelson and Siegel (1987) interpolation function. For firms with multiple bond observation, a weighted average yield to maturity is calculated, with the weight of each debt issue being the fraction of amount outstanding for that issue divided by the total market value of all outstanding traded debt for the firm.

C. Takeover Defenses and other Corporate Governance Variables

We examine an index of antitakeover amendments and managerial ownership. We also include institutional blockholders as a control variable in the analysis. Our primary measure of takeover defenses is the Gompers, Ishii, and Metrick (2003) index (GIndex). This index is computed using five governance rules and 24 provisions described in Section A. A high value of the GIndex indicates a large number of antitakeover amendments, while a low value represents small number of antitakeover amendments.

Our primary measure of managerial ownership is CEO ownership, which we compute as the percentage of common stock held by the CEO relative to amount of shares outstanding.⁴ To account for non-linearities in CEO ownership, we follow McConnell and Servaes (1990) and include the square of CEO ownership. We also include blockholders as a control variable. For robustness, we compute the percentage of stock ownership of the top five insiders of the firm and find similar results. We measure institutional blockholdings by adding the percentage holdings of all blockholders for that firm. Blockholders are defined as those with at least five percent stock ownership. For companies that did not report any CEO ownership and blockholdings, a value of zero is assigned for these variables.⁵

D. Control Variables

We incorporate firm specific and security specific control variables into the analysis of leverage and cost of debt financing. Firm specific measures include firm size (Size), stock return volatility (Volatility), profitability (Profit), market to book ratio (MTB), tangibility (Tangibility), R&D expenses (R&D), and selling and administrative expenses (SGA). Security specific variables include credit ratings (Rating), debt age (Age), and high yield bond indicator (High Yield).

Conventional factors used in determining the level of debt are those used in Rajan and Zingales (1995) in addition to selling and administrative expenses (SGA). All control variables are lagged one

⁴ For example, Frye (2004) finds a positive relation between firm performance and employee stock compensation.

⁵ In the leverage analysis, about 64 percent have positive blockholdings and 33 percent have positive CEO ownership. In cost of debt analysis, about 69 percent have positive blockholdings and 43 percent have positive CEO ownership. Furthermore, we carried out our analyses using maximum blockholdings as in Cremers, Nair, and Wei (2005) and find similar results.

period to insure that they are in the information set when debt levels are determined. Firm size is the natural logarithm of the firm's sales (data #12)⁶. Market to book is the ratio of market value of assets (explained as in leverage in Section A) to book value of total assets (data #6). Profitability is calculated as earnings before interest, taxes and depreciation (data #13). Tangibility is computed as net plant property and equipment (data #8); R&D and SGA are data #46 and data #189, respectively. Profitability, tangibility, R&D, and SGA are scaled by book value of total assets. Pecking order theory of capital structure (Myers (1984)) suggests that financing deficit should be filled primarily by debt, resulting in a debt-deficit sensitivity coefficient of 1. Shyam-Sunder and Myers (1999) find that debt-deficit sensitivity coefficient is indeed between 0.7 to 0.9 range and Frank and Goyal (2003) find that it is between 0.4 to 0.7 range using data with no gaps in the flow of funds information. Thus, to include the predictions of pecking order theory as in Shyam-Sunder and Myers (1999), and Frank and Goyal (2003), we include deficit as a control variable when analyzing the first differences in leverage. Deficit is calculated as long-term debt issued (data #111) minus long-term debt retired (data #114) plus net equity issued (data #108) minus equity bought back (data #115). Deficit is also scaled by the book value of assets. To proxy for default risk, we use a measure of stock return volatility. Volatility is the standard deviation of stock returns for the prior 60 months.

Security specific variables include credit ratings (Rating), debt age (Age), and a high yield indicator (HighYield). For bond ratings, we use S&P long-term domestic issuer credit ratings from COMPUSTAT (data SPDRC). COMPUSTAT assigns higher values for lower debt ratings. Bond ratings that are below 13 are investment-grade bonds. In our sample, the lowest and highest ratings are 2 and 18, respectively. We transform COMPUSTAT ratings such that a high rating value corresponds to better credit ratings. We accomplish this using a linear transformation (19 minus data SPDRC) as our Rating variable. In addition, since credit ratings may exhibit non-linearities as many institutions are barred from holding securities below a certain grade, we include a binary variable (HighYield) to denote those firms with non-investment grade debt. Using our rating variable, high yield debt corresponds to those that are valued at 6 and below.

For bond liquidity, the fixed income literature provides three proxies: the age of the bond, the amount available for trade, and the bid-ask spread (Sarig and Warga, 1989). Because the Lehman Brothers Fixed Income database does not report either the amount available for trade or the bid-ask

⁶ Our results are robust to alternative measures of firm size (natural logarithm of total sales or total assets).

spread, we use bond age as a measure of liquidity. Beim (1992) finds that bonds lose about one third of their liquidity in the first two years of trading. Bond age (Age) is computed as the number of years that a bond has been outstanding. This is a weighted-average difference between the trade date and the original bond issue date. For example, a bond with a trade date of April 30, 2000, and an issue date of January 31, 1997, has an age of 3.25 years.⁷

E. Descriptive Statistics

Table 1 provides descriptive statistics for our sample. Panel A shows means, medians, standard deviations, 25th percentile and 75th percentile values for the variables used in the analyses. The firms in our sample have mean and median market value of leverage of about 19 percent and 15 percent, respectively. The yield spread in our sample has a mean of about 243 basis points, a median of about 159 basis points, and 25th and 75th percentile value of about 95 and 297, respectively. GIndex has mean and median values of about 9, and 25th and 75th percentile values of 7 and 11, respectively. Our sample firm-years have blockholders with median of about 12% and mean of about 9%. The variable CEO ownership has a mean of about 1.3%, a median of 0.01%, suggesting that a large portion of the sample has small CEO ownership. The 5th and 10th percentiles of CEO ownership are 0 percent and 90th and 95th percentiles are 2.54 and 5.99 percent, respectively.⁸

In terms of firm and security specific information, the average firm in the sample has sales of \$7 billion, is profitable with a ratio of about 15%, has research and development expenditures to total assets of about 3%, have tangible assets of about 33% relative to their total assets, and have a market-to-book ratio of about 1.65. Median return volatility is about 70%. The average bond in our sample has been outstanding for about 4 years, and has a credit rating of BBB+.

Panel B of Table 1 provides descriptive statistics for the sample segmented by quartiles of leverage and yield spread. The univariate statistics based on leverage and yield spread subgroups suggest that the GIndex is stable across all quartiles. CEO ownership exhibits a non-linear pattern with leverage and is higher for larger yield spreads. Blockholdings are higher for the top quartile of leverage and yield spread. Firm volatility increases with firm leverage and firm yield spread. As expected, with increasing leverage, yield spread increases and credit rating decreases. Debt age does

⁷ We also included duration as an additional variable. Since the yield spreads are calculated using a duration-matched Treasury security, however, this variable is found to be insignificant.

⁸ Upper and lower 5th and 10th percentile results are not reported in Table 1 to conserve space.

not change across leverage quartiles but is higher for higher yield spreads. Additionally, low profitability and low market to book values are accompanied with higher leverage and higher yield spreads.

Panel C of Table 1 provides a breakdown of the number of firm-year observations based on Standard Industry Classification (SIC) codes. Industries in the sample include: mining, manufacturing, transportation, wholesale trade, retail trade, and services. Most of the firms in the sample are in manufacturing (about 61%), followed by wholesale and retail trade (about 14%), and mining and construction (about 7%). The least observations are in health-private household (about 3%). For our sample, we have eliminated all observation in the finance and utilities sector.

Table 2 shows the correlation coefficients among leverage, spread, governance, and control variables. As expected, there is a strong positive correlation between leverage and spread. The CEO ownership is negatively correlated with leverage but positively correlated with spread, whereas the GIndex variable positively correlated with leverage but negatively correlated with spread. The analyses of the correlation coefficients of control variables with spread and debt indicate that the relation among most of these variables agree with those reported in the related empirical literature. Blockholders are positively correlated with both leverage and spread. Profitability, market to book ratio, R&D expenditures, selling and administrative expenses, and bond rating are negatively correlated with both yield spread and leverage. Volatility and bond age are positively related with spread and negatively related with leverage.

IV. Empirical Results

We examine how takeover defenses, managerial ownership and their interaction affect debt levels and bond yield spreads in relation to firms' agency conflicts. We examine first firm leverage, and then cost of debt financing. Subsequently, we perform a battery of robustness tests.

A. Takeover Defenses, Managerial Ownership, and Firm Leverage

To assess how managerial ownership and takeover defenses affect leverage decisions of firms, we examine the level of the market value of debt in relation to the level of CEO ownership and the GIndex. We consider CEO ownership as an internal governance mechanism since it represents

ownership in the firm. We control for the nonlinearity in CEO ownership by including the square of CEO ownership, as in McConnell and Servaes (1990). The GIndex is considered as an index of takeover defenses since these provisions aim to reduce takeover threats or increase the costs of takeovers. We analyze these mechanisms separately, and in relation to each other by examining their interaction. To control for the possible endogeneity between CEO ownership and GIndex, we carry out two different approaches in the regressions: We orthogonalize CEO ownership with respect to GIndex and use the residuals in the regressions; and we instrument CEO ownership using CEO age and CEO tenure. In the latter approach, we also instrument the interaction of CEO ownership with GIndex using the interaction of GIndex with CEO age and CEO tenure.⁹ We consider CEO age and CEO tenure to instrument managerial ownership since Jensen and Murphy (1990) explain CEO wealth as a function of CEO age, and Hermalin and Weisbach (1998) predict that CEOs with more tenure should have more bargaining power.¹⁰ We obtain CEO tenure and CEO age from COMPUSTAT ExecuComp. This dataset starts at 1992. For 1990 and 1991 and for missing observations, we collect data from proxy statements. For CEO age after 1996, we also use IRRC Directors dataset to fill in the missing observations. As a result, in the leverage and spread regressions, we have 10,593 observations and 2,509 observations, respectively. For this set of regressions, we report the second stage regression results on leverage. The Hansen's J statistics¹¹, partial R-squares and F statistics reported in Table 3 suggest that the instrument set is valid and can explain the dynamics of CEO ownership. We also include institutional blockholdings and the interaction of this variable with GIndex to consider the monitoring function of the blockholders. For firm-specific controls, we use the conventional variables applied in the trade-off theory literature, namely profitability (Profit), market to book (MTB), tangible assets (Tangible), selling and administrative expenses (SGA), natural logarithm of sales (Size), and research and development expenses (R&D). The regression equation is

$$Leverage_{i,t} = \alpha + A_{1,\dots,m,i,t} \sum_{j=1}^m \beta_j GovernanceSpecific_{j,i,t} + \sum_{j=m+1}^n \beta_j FirmSpecific_{j,i,t} + \varepsilon_{i,t} \quad (3)$$

where the market value of leverage (Leverage) is the dependent variable and the n independent variables are provided based on governance and firm specific variables, in which the first m are

⁹ See Wooldridge (2002), pp. 115-128.

¹⁰ We are thankful to the referee for the suggestion of this approach.

¹¹ See Hansen (1982).

governance variables in above equation. We use lagged variables of the independent variables so that they are in the information set when debt levels are determined.¹² Of interest in our analysis are the governance variables in isolation and when interacted. We report the results using fixed effects model and use White (1980)'s heteroscedasticity adjustment in standard error estimation.¹³

The results are reported in Table 3. Leverage increases with firm size and tangible assets, but decreases with market to book ratio, profitability, and selling and administrative expenses. Column 1 includes the index of antitakeover amendments (GIndex) in addition to control variables. There is a positive and significant relation between leverage and the GIndex (coefficient of 0.249 with a t-stat=1.84). This is consistent with Wald and Long (2007), who find that leverage is higher in firms that are incorporated in states with strong antitakeover laws.

Column 2 of Table 3 reports the results on leverage in relation to managerial ownership. We also control for institutional blockholders to include the effect of their monitoring function on debt levels. Column 3 and Column 4 of Table 3 includes GIndex as well as CEO and blockholder variables. The results presented in Column 3 and 4 are mostly comparable to those reported in Column 2. In addition, GIndex is significantly positively related to leverage as in Column (1). The significance of GIndex is higher in Column (4) when CEO ownership is instrumented using CEO age and CEO tenure to control for the possible endogeneity between GIndex and CEO ownership. Debt level decreases with CEO ownership, but then increases when CEO ownership is large (supporting our hypothesis H1 for cases with weak takeover defenses). Entrenchment increases with managerial holdings since managers have enough control power on their own (Morck, Shleifer, and Vishny (1988) and Stulz (1988)). Therefore these managers increase debt to avoid control challenges or to increase takeover premium. These findings therefore suggest that managerial holdings and takeover defenses should be analyzed collectively, since debt levels depend not only on managerial holdings, but also on how managers react to takeover defenses given their managerial holdings, which we analyze in Column 5 and Column 6. Furthermore, we find a positive relation

¹² For robustness, we also run the regressions without lagging the independent variables. Results are comparable to those reported except that adjusted R-squared increases to 18 percent when all variables are included. We also run the regressions using industry dummies (based on two digit SIC-codes) rather than using deviations from firm level means and find that results are comparable to those reported, except that adjusted R-squared increases to 32 percent when all variables are included.

¹³ We use mean deviations from firm level to control for firm effects and include year dummies. We also use industry dummies instead of firm dummies, run Fama-MacBeth regressions and analyze change in debt levels to consider the pecking order theory predictions. The results related to the impact of governance mechanisms on firm leverage are comparable to those reported in the fixed effects model.

between debt and blockholders in Column 2 as in Berger, Ofek and Yermack (1997), but this result disappears when GIndex is included in Column 3 and Column 4.

Column 5 and Column 6 of Table 3 provide the results where all governance variables and the interaction of takeover defenses with CEO ownership, the square of CEO ownership, and blockholders are included. All the governance variables in isolation confirm our earlier results. When interaction variables are examined, it appears that for CEO ownership, the interaction variable is positive, and for the quadratic term it becomes negative, and both statistically and economically significant. Using the results presented in Column 6, one standard deviation increase in the interaction of GIndex with CEO ownership increases leverage by 4.7% and one standard deviation increase in the interaction of GIndex with the quadratic CEO ownership reduces leverage by 8.6%. When we increase firm level control variables by one standard deviation, we find that market to book ratio, profitability and SGA reduce leverage by 0.6%, 16.5% and 13.2%, respectively, and firm size and tangibility increase leverage by 0.8% and 10.5%, respectively. These results suggest that, in comparison to size and growth opportunities, the interaction of GIndex with CEO ownership has more economic impact on firm leverage.¹⁴ The blockholder interaction variable is not significant.¹⁵ We offer explanation to these findings below.

The literature suggests that as managerial ownership increases, managers become more entrenched since they have enough control power on their own. We find that when a firm has a high GIndex (strong takeover defenses), managers with large holdings reduce debt levels, supporting our hypothesis H2. Since these managers are entrenched and takeover control mechanism is weak due to takeover defenses, they prefer to operate at lower debt levels as in the free cash flow hypothesis. Another interesting finding is that, when we control for the interaction between the GIndex and the managerial holdings, the GIndex loses its significance in relation to debt levels. This suggests that leverage decisions of the firms are related to managerial holdings and how managerial holdings interact with takeover defenses, but not to takeover defenses per se. Thus, a two-dimensional corporate governance mechanism that includes the interaction of between these governance mechanisms is relevant in understanding how governance mechanisms affect leverage decisions of the firms.

¹⁴ We are thankful to the referee for this constructive suggestion.

¹⁵ We also run these regressions using the book value of debt for dependent variable. The results are comparable to those obtained using the market value of debt.

While this section examines the leverage choice of managers, analyzing how bondholders decide on yield spreads in relation to these governance mechanisms enhances our understanding of firm financing policies. We provide evidence in the next section by examining the impact of takeover defenses and managerial holdings on bond yield spreads, controlling for the effects of these governance variables on leverage.

B. Takeover Defenses, Ownership, and Yield Spread

To examine the yield spread in relation to governance mechanisms and also control for the impact of these governance mechanisms on firm leverage, we employ simultaneous equations model. We use a two stage least squares model where leverage is determined by the factors analyzed in Section A. The predicted leverage enters as an explanatory variable in the second stage spread regression where yield spread is explained by governance mechanisms considered in Section A and control variables. Control variables used in the spread regression are debt age, stock return volatility, firm size, profitability, bond ratings, a high yield dummy equal to 1 if the bond is non-investment grade, and predicted leverage obtained from the first stage. The instrumental variable approach requires a number of exogenous variables that affect only leverage or spread but not both. We consider R&D and selling and administrative expenses to affect leverage but not spread since it is difficult for bondholders to value these variables, whereas managers have insider information related to them. Considering CEO ownership, we follow two approaches as in leverage: We orthogonalize CEO ownership with respect to GIndex and use the residuals in the regressions; and we instrument CEO ownership using CEO age and CEO tenure. The overidentifying restrictions fail to reject in each case suggesting that the instruments are valid. We also report partial R-squares and F-statistics for the CEO ownership and leverage when both are instrumented. These statistics suggest that excluded instruments can explain the dynamics of the endogenous variables. The second stage regression of simultaneous equations model is

$$\begin{aligned}
 Spread_{i,t} = & \alpha + \sum_{j=1}^m \beta_j Governance\ Specific_{j,i,t} + \sum_{j=m+1}^n \beta_j FirmSpecific_{j,i,t} \\
 & + \sum_{j=n+1}^l \beta_j SecuritySpecific_{j,i,t} + \beta_{l+1} Leverage_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{4}$$

where the yield spread (Spread) is the dependent variable and the $(l+1)$ independent variables are m governance, $(n-m)$ firm specific, $(l-n)$ security specific variables, and the predicted leverage from first stage regression. First stage regression of leverage is as presented in equation (3) in Section A. Of interest in our analysis are the governance variables in isolation and when interacted. We control for firm and year effects, and use White (1980)'s heteroscedasticity adjustment in standard error estimation.¹⁶

Table 4 provides the results on yield spread in relation to these governance mechanisms obtained using simultaneous equations model. Column 1 displays the yield spread results in relation to GIndex along with the control variables. Consistent with prior literature, we find that firms with a large number of antitakeover provisions (high GIndex) have lower yield spreads. The coefficients on the control variables have their expected signs. Yield spread increases with leverage, bond age and with high yield dummy, and decreases with firm size and bond rating. In column 2, consistent with Cremers, Nair, and Wei (2006), we find that an increase in blockholdings increases yield spread. This finding suggests that bondholders do not like stockholder opportunism and therefore protect themselves from the possibility of asset substitution by pricing the debt accordingly to reflect this disadvantage. There is no significant relation between CEO ownership and yield spreads. Column 3 and Column 4 combine all the governance variables and find similar results.

Column 5 and Column 6 of Table 4 examine the yield spread in relation to CEO ownership, blockholders, GIndex as well as the interaction of GIndex with CEO ownership and blockholders. When we examine the relation of CEO ownership with the cost of debt financing, we find that firms with strong takeover defenses (high GIndex) have lower yield spreads when CEO ownership is large but are not affected from managerial ownership in other cases. This provides some support for our hypothesis H6, where bondholders and entrenched managers with large ownership are aligned, and therefore, bondholders reduce debt-financing costs for these firms. Furthermore, consistent with Cremers, Nair and Wei (2006), when the firm has a large number of antitakeover provisions, yield spreads are lower in the existence of blockholders. This finding suggests that when a firm has strong takeover defenses, wealth transfer risk is low and thus bondholders require a lower yield for better monitoring provided by blockholders. Using the results given in Column 6, one standard deviation increase in the interaction of GIndex with the quadratic term on CEO ownership and with

¹⁶ As with leverage, we also carried out Fama-MacBeth and change in spread regressions. We also include industry dummies rather than taking deviation from firm level means. Results are comparable to those reported here.

blockholders reduce yield spread by 12 and 3 basis points, respectively. One standard deviation increase in blockholders alone increases spread by 43 basis points. Among control variables, one standard deviation increase in leverage, volatility and debt age increase yield spread by 42, 22 and 8 basis points, respectively, and one standard deviation increase in profitability and size decrease yield spread by 39 and 10 basis points respectively. Therefore, blockholders and the interaction of GIndex with high CEO ownership have more economic effect on yield spread than size and age but not as much as the other control variables.

C. Robustness

For robustness, we examine the firm's leverage choice using Heckman (1976) two-step estimation procedure to control for the possibility of sample selection bias. In addition, we analyze leverage and the cost of debt financing using changes regression. We also examine them in the existence of bond covenants.¹⁷

In the Heckman two-step estimation, we run a Probit model in the first stage, where leverage takes a value of zero or 1. We run the Probit model using 12,185 firm-year observations for the data period of 1990-2000. These firm-years have GIndex, total assets and sales data available. Among these 12,185 firm years, 11,011 have non-zero leverage ratios. Thus we consider the leverage variable equal to 1 if the firm-year has non-zero leverage ratio and zero otherwise. Next, using the inverse Mill's ratio obtained from the first stage, we run the second stage OLS regressions with 11,011 firm year observations with non-zero leverage, where the dependent variable is the market value of leverage defined in Section II.B. In changes regressions, we examine one year changes in the variables discussed in Sections A and B.¹⁸ In the changes regressions of leverage, we also include a financing deficit variable in a manner similar to Shyam-Sunder and Myers (1999) and Frank and Goyal (2003) to include the pecking order theory predictions of Myers (1984). Pecking order theory suggest that financing deficit should be covered primarily with debt. The changes regressions of yield spread are two-stage least square equations, where leverage is determined in the first stage using the factors in Section A. In the bond covenants regression, we form a covenant index as described

¹⁷ We also examine debt maturity in relation to these governance mechanisms, but do not find any significant relation.

¹⁸ The number of observations reduces to 9,584 from 11,011 in the changes regression. We lose 897 observations due to calculating changes and 520 observations due to gaps in firm-year observations for some firms.

in Section III.A., and analyze the interaction of this index with governance variables in relation to leverage and cost of debt.¹⁹ Results are reported in Table 5.

In Column 5 and Column 7, we also instrument Covenant index using depreciation and intangible assets. Additionally, we instrument the interaction of covenant index with CEO ownership using the interaction of CEO age and CEO tenure with depreciation and intangibles. CEO ownership and the interaction of CEO ownership with GIndex are instrumented as it is discussed in Section IV.A. Depreciation is calculated as depreciation expense (COMPUSTAT item 125) over total assets (COMPUSTAT item 6). Intangibles variable is measured as intangibles (COMPUSTAT item 33) over total assets. We choose intangibles and depreciation as instruments for covenant index due to their relation to covenants in terms of tax purposes. According to Internal Revenue Code Section 197(d)(1)(E)²⁰, an intangible includes any covenant not to compete entered into in connection with an acquisition (directly or indirectly) of an interest in a trade or business. Thus certain covenants are considered as intangibles according to the Internal Revenue Code. With respect to depreciation, as discussed in Graham and Tucker (2006), accelerated depreciation is considered as a non-debt tax shield and thus is used as a tool to reduce covenant violation among other purposes. Since depreciation can be used to reduce the risk of covenant violation, we include it as an instrument for covenant index. The partial R-squares and F-statistics suggest that these instruments explain the variation in the Covenant index. Also, overidentifying restriction tests fail to reject suggesting that the instrument set is valid.

Column 1 of Table 5 reports the results of the second stage of Heckman two-step procedure. The Inverse Mill's ratio is not significant, indicating that sample selection bias does not exist. The results are comparable to those reported in Table 3. CEO ownership affects leverage in relation to takeover defenses. Firms with large managerial ownership operate at lower debt levels when takeover defenses are strong.

Columns 2 and 3 of Table 5 provide the results from the changes regression. The results are consistent with our primary findings and suggest that CEO ownership, and its interaction with the GIndex are significantly related to firm leverage. The signs of the variables are the same as those reported in Tables 3. In addition, the financing deficit variable, as expected, has a positive and significant (at the 1% level) coefficient of 0.348. Blockholders reduce yield spreads if the firm has a

¹⁹ The coefficients on control variables are comparable to those reported in Tables 3 and 4 and thus not reported on Table 5.

²⁰ See <http://www.taxalmanac.org>

large number of antitakeover provisions. These results confirm our earlier findings that it is useful to consider how these governance variables interact with takeover defenses.

Column 4 and Column 5 in Table 5 examine the impact of bond covenants on debt levels. We find that covenant index and its interaction with governance variables do not significantly affect debt levels, consistent with our hypothesis H4(b). The results related to GIndex, managerial holdings, blockholders and leverage in the presence of bond covenants are similar to those reported without bond covenants.

In column 6 and column 7 in Table 5, we consider the impact of bond covenants on yield spreads. Bondholders reduce the yield spread for firms with high covenant index when the firms have large CEO ownership (supporting our hypothesis H7) and when they have blockholders (as in Cremers, Nair and Wei (2006)). The existence of covenants, however, does not reduce the significance of GIndex in relation to blockholders. In this respect, even though covenants reduce event risk, antitakeover provisions are still effective in reducing yield spread further in the existence of blockholders.

Overall, the evidence on bond covenants suggests that even though covenants affect yield spreads by reducing the event risk for bondholders and protecting them against the asset substitution problem, they are not effective in the leverage decisions. Leverage decisions are firm level decisions and firm characteristics play an important role in determining debt levels. Since antitakeover provisions are firm level and bond covenants are issue level measures, antitakeover provisions in relation to managerial ownership affect the leverage decisions of the firms but bond covenants do not.

V. Conclusion

This paper investigates firms' debt financing decisions in relation to managerial ownership and takeover defenses. Using recent data on takeover defenses, we find that the impact of the agency conflicts on the firm's debt level is closely related to the interaction of managerial ownership with takeover defenses. Specifically, we find that the presence of a large number of antitakeover provisions (high GIndex) along with large managerial equity ownership is associated with lower debt levels. When a firm has a large number of takeover defenses, managers with large ownership become entrenched, and operate at lower debt levels, consistent with the free cash flow hypothesis. This

relation reverses in firms with weak takeover defenses: managers with large ownership increase debt levels. This finding is consistent with these managers increasing debt levels to avoid control threats since takeover defenses are weak. We also find that the relation between leverage and antitakeover provisions becomes insignificant when we control for the interaction between these provisions and managerial ownership. This suggests that takeover defenses per se do not affect leverage decisions but their interaction with managerial holdings does. Furthermore, we bring evidence that bond covenants in relation to managerial ownership do not affect debt levels in most cases.

We also examine the interaction between managerial holdings and takeover defenses in relation to the cost of debt financing. Consistent with prior research, we find an inverse relation between antitakeover provisions and the cost of debt financing. Managerial holdings, however, do not affect yield spreads in most cases.

The overall evidence suggests that the interaction between managerial holdings and takeover defenses affects firms' debt financing decisions. This provides support for recent studies that suggest that a one dimensional governance system may not fully explain the variations in firm policies. Thus, a two-dimensional aspect of governance that considers how governance mechanisms interact is useful for understanding the agency conflicts associated with firms' financing decisions.

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Table 1
Descriptive Statistics

Panel A: Descriptive statistics for overall sample

This panel provides summary statistics for the data employed in the analysis. The dataset comprises 11,011 firm-year observations for leverage related variables and 2,570 for spread related variables covering the period 1990 through 2000. The descriptive statistics include: Gompers, Ishii, and Metrick (2003) index for antitakeover provisions (GIndex), institutional blockholdings (Blockholder), and CEO stock ownership (CEO). Firm yield spread (Spread) is in basis points and market value of leverage (leverage) is long term debt to market value of assets. Firm specific control variables include: standard deviation of equity return (volatility), sales, market to book (MTB), firm profitability (Profit), research and development expenditures to assets (R&D), tangible assets to total assets (Tangible), ratio of net long-term debt plus net equity to total assets (Deficit), and selling and administrative expenses to assets (SGA). Security specific control variables include bond ratings (Rating) and the age of the bond (Age). The data are winsorized at the 0.5 percent level at the tails of distribution.

Variable	Mean	Median	Standard Deviation	25th Percentile	75th Percentile
Leverage (%)	19.214	14.567	18.337	3.745	29.488
Spread	242.597	159.000	269.024	95.075	297.010
GIndex	9.064	9.000	2.867	7.000	11.000
CEO (%)	1.276	0.009	5.489	0.000	0.202
Blockholder (%)	11.842	8.942	12.078	0.000	19.166
Sales	7.055	6.946	1.448	6.089	7.982
Profit (%)	14.562	14.570	9.624	9.871	19.594
MTB	1.653	1.217	1.393	0.881	1.878
R&D (%)	2.918	0.000	5.300	0.000	3.423
Tangible (%)	33.475	28.955	21.080	17.626	45.576
SGA (%)	25.50	21.11	21.27	8.86	36.76
Volatility (%)	97.303	70.025	92.778	44.588	113.519
Rating	BBB+	BBB+	BB+/A+	BB+	A
Age	4.071	3.552	3.035	2.050	5.407
Deficit (%)	0.584	-0.128	9.749	-3.426	3.510

Panel B: Internal and External Governance Segmented by Quartiles

This panel provides summary statistics reported in Panel A for the sub-samples segmented according to the leverage and yield spread. The labels Q1, Q2, Q3, and Q4 denote percentages below 25%, above 25% to 50%, above 50% to 75%, and above 75%, respectively.

	<u>Firm Leverage</u>				<u>Yield Spread</u>			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Leverage (%)					14.3	19.0	27.7	42.0
Spread (bp)	221.39	148.83	256.19	397.40				
GIndex	8.182	9.340	9.590	9.144	9.904	10.171	9.984	8.928
CEO (%)	2.1	1.1	0.8	1.0	0.6	0.7	1.2	2.0
Blockholder (%)	11.3	10.8	11.8	13.5	10.2	11.4	13.4	16.1
Sales	6.504	7.252	7.326	7.138	8.610	8.606	8.117	7.248
Profit (%)	18.1	16.23	13.7	10.2	17.9	16.1	14.3	11.5
MTB	2.735	1.763	1.210	0.903	1.896	1.663	1.291	1.136
R&D (%)	5.6	3.2	1.8	1.1	2.3	1.9	1.5	1.1
Tangible (%)	24.9	32.7	37.8	38.5	37.56	38.07	38.53	35.21
SGA	35.36	24.42	18.68	18.07	23.17	20.32	19.26	18.33
Volatility	1.085	0.978	0.870	0.958	0.268	0.287	0.324	0.430
Rating	A	A-	BBB+	BB+	A	A-	BBB	BB
Age	3.46	3.57	3.66	3.57	3.39	3.99	4.69	4.71
Deficit (%)	-0.15	0.2	1.3	2.3	-0.3	-0.3	0.5	1.0
Observations	2753	2753	2752	2753	642	643	643	642

Panel C. Industry Data

Panel B includes the number and percentage of firm-year observations for each industry group in the sample using single digit SIC codes. The dataset is comprised of 11,011 firm year observations covering the period 1990 through 2000.

SIC Code	Titles of Industries	Firm-Year Observations	Observations (%)
1	Mining and Construction	789	7.17%
2	Manufacturing (Food-Petroleum)	2682	24.36%
3	Manufacturing (Plastics-Electronics)	4087	37.12%
4	Transportation and Communication (Excluding utilities)	640	5.81%
5	Wholesale Trade and Retail Trade	1530	13.90%
7	Services (Hotels-Recreation)	944	8.57%
8	Services (Health-Private Household)	339	3.08%

Table 2
Pearson Correlations

This table provides the correlations between variables. The dataset comprises 11,011 firm-year observations for leverage related variables and 2,570 for spread related variables covering the period 1990 through 2000. The variables are: firm leverage (Leverage), yield spread (Spread), Gompers, Ishii, and Metrick (2003) corporate governance index for antitakeover defenses (GIndex), institutional blockholdings (Blockholder), and CEO stock ownership (CEO). Firm yield spread (Spread) is in basis points and market value of leverage (leverage) is long-term debt to market value of assets. Security specific controls include: credit ratings (Rating) and debt age (Age). Firm specific control variables include: standard deviation of equity return (Volatility), log of sales (size), market to book (MTB), firm profitability (Profit), tangibility (Tangible), R&D expenditures to assets (R&D), and selling and administrative expenses to assets (SGA). The data are winsorized at the 0.5 level at the tails of the distribution. Significance is provided below each coefficient in parenthesis.

	Leverage	Spread	GIndex	CEO	Blockholder	Size	Profit	MTB	R&D	Tangible	SGA	Deficit	Volatility	Rating
Spread	0.543 (0.00)													
GIndex	0.064 (0.00)	-0.153 (0.00)												
CEO	-0.056 (0.00)	0.06 (0.00)	-0.101 (0.00)											
Blockholder	0.075 (0.00)	0.145 (0.00)	-0.022 (0.02)	0.007 (0.49)										
Size	0.084 (0.00)	-0.373 (0.00)	0.191 (0.00)	-0.025 (0.01)	-0.135 (0.00)									
Profit	-0.318 (0.00)	-0.324 (0.00)	0.013 (0.18)	0.032 (0.00)	-0.026 (0.01)	0.222 (0.00)								
MTB	-0.431 (0.00)	-0.193 (0.00)	-0.121 (0.00)	0.115 (0.00)	-0.051 (0.00)	-0.056 (0.00)	0.411 (0.00)							
R&D	-0.285 (0.00)	-0.122 (0.00)	-0.079 (0.00)	0.008 (0.41)	0.003 (0.74)	-0.217 (0.00)	-0.131 (0.00)	0.292 (0.00)						
Tangible	0.202 (0.00)	-0.026 (0.2)	0.064 (0.00)	-0.055 (0.00)	-0.051 (0.00)	0.086 (0.00)	0.095 (0.00)	-0.135 (0.00)	-0.257 (0.00)					
SGA	-0.277 (0.00)	-0.063 (0)	-0.06 (0.00)	0.046 (0.00)	-0.015 (0.12)	-0.039 (0.00)	0.146 (0.00)	0.149 (0.00)	0.252 (0.00)	-0.296 (0.00)				
Deficit	0.125 (0.00)	0.055 (0.01)	-0.034 (0)	0.015 (0.11)	0.003 (0.72)	-0.076 (0.00)	-0.249 (0.00)	0.02 (0.04)	0.071 (0.00)	0.031 (0)	-0.137 (0.00)			
Volatility	-0.011 (0.57)	0.17 (0.00)	-0.121 (0.00)	0.086 (0.00)	0.006 (0.74)	-0.119 (0.00)	0.022 (0.26)	0.162 (0.00)	0.057 (0)	-0.088 (0.00)	0.018 (0.37)	0.025 (0.2)		
Rating	-0.696 (0.00)	-0.606 (0.00)	0.083 (0.00)	-0.102 (0.00)	-0.248 (0.00)	0.552 (0.00)	0.423 (0.00)	0.377 (0.00)	0.263 (0.00)	-0.032 (0.11)	0.144 (0.00)	-0.124 (0.00)	-0.218 (0.00)	
Age	-0.063 (0.01)	0.163 (0.00)	0.027 (0.23)	-0.006 (0.8)	-0.0003 (0.99)	0.087 (0)	-0.057 (0.01)	-0.055 (0.02)	0.067 (0)	-0.041 (0.07)	-0.033 (0.15)	-0.149 (0.00)	0.054 (0.02)	0.018 (0.44)

Table 3
Takeover Defenses, Ownership, and Firm Leverage

This table gives the estimated coefficients of the corporate governance variables and conventional factors in leverage regressions. Dependent variable is market value of leverage. The data covers the period 1990 through 2000. Governance variables include: Gompers, Ishii, and Metrick (2003) index for antitakeover provisions (GIndex), institutional blockholdings (Blockholder), CEO stock ownership (CEO), and the squared variable of CEO (CEO2). Firm specific control variables are: log of sales (Size), market to book (MTB), firm profitability (Profit), research and development expenditures to assets (R&D), tangible to assets (Tangible), and selling and administrative expenses to assets (SGA). Independent variables are lagged by one period. The variables are based on firm level deviations from the means with year dummies to control for fixed effects. Heteroscedasticity adjustment is used for estimating standard errors. In columns (3) and (5) GIndex is orthogonalized with respect to CEO ownership and residuals are used in the regression. In columns (4) and (6) CEO ownership is instrumented on CEO age and CEO tenure and second stage regressions and statistics on instrument set are presented. The labels ^{a, b, c} denote significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Size _(t-1)	0.038 ^a (11.20)	0.038 ^a (12.62)	0.039 ^a (11.52)	0.078 ^a (6.38)	0.040 ^a (11.69)	0.083 ^a (6.21)
MTB _(t-1)	-0.014 ^a (-9.96)	-0.013 ^a (-10.05)	-0.015 ^a (-10.09)	-0.018 ^a (-5.09)	-0.015 ^a (-10.13)	-0.019 ^a (-3.54)
Profit _(t-1)	-0.297 ^a (-14.49)	-0.300 ^a (-16.06)	-0.298 ^a (-14.54)	-0.299 ^a (-6.97)	-0.299 ^a (-14.57)	-0.281 ^a (-5.33)
R&D _(t-1)	-0.080 (-1.30)	-0.080 (-1.48)	-0.078 (-1.28)	-0.005 (-1.04)	-0.075 (-1.23)	-0.005 (-0.84)
Tangible _(t-1)	0.041 ^b (2.23)	0.054 ^a (3.17)	0.043 ^b (2.34)	0.072 ^b (2.13)	0.043 ^b (2.36)	0.105 ^b (2.19)
SGA _(t-1)	-0.076 ^a (-4.49)	-0.081 ^a (-5.22)	-0.078 ^a (-4.62)	-0.103 ^b (-2.35)	-0.079 ^a (-4.67)	-0.104 ^b (-2.29)
GIndex _(t-1)	0.249 ^c (1.84)		0.003 ^b (1.97)	0.014 ^a (2.93)	0.001 (0.95)	0.011 (1.26)
CEO _(t-1)		-0.249 ^a (-4.36)	-0.262 ^a (-4.35)	-0.491 ^a (-2.71)	-0.340 ^a (-5.28)	-0.591 ^a (-2.58)
CEO2 _(t-1)		0.344 ^a (3.09)	0.348 ^a (2.94)	0.536 ^b (2.26)	0.463 ^a (3.65)	0.529 ^b (2.11)
Blockholder _(t-1)		0.022 ^c (1.81)	0.021 (1.57)	0.054 (1.46)	0.019 (0.54)	0.227 (1.27)
GIndex _(t-1) *CEO _(t-1)					0.354 ^a (3.11)	0.535 ^a (2.61)
GIndex _(t-1) *CEO2 _(t-1)					-0.566 ^b (-2.34)	-0.612 ^b (-2.11)
GIndex _(t-1) *Blockholder _(t-1)					0.0001 (0.04)	0.017 (1.37)
Adjusted R-Squared	0.106	0.103	0.111	0.121	0.115	0.128
Observation	11,011	11,011	11,011	10,593	11,011	10,593
Overidentifying restrictions						
Hansen's J test p-value				0.224		0.304
Partial R-square						
CEO ownership				0.123		0.132
GIndex*CEO ownership						0.115
F statistics						
CEO ownership				11.27 ^a		12.6 ^a
GIndex*CEO ownership						12.03 ^a

Table 4
Takeover Defenses, Ownership, and Firm Yield Spread

The table provides the second-stage regression results from a two-stage least square model. The dependent variable in the second stage regression is yield spread (Spread). The data used covers the period 1990 through 2000. Governance variables include: Gompers, Ishii, and Metrick (2003) index for antitakeover provisions (GIndex), institutional blockholdings (Blockholder), CEO stock ownership (CEO), and square of CEO ownership (CEO2). Independent variables in the yield spread regression are standard deviation of equity return (Volatility), log of sales (Size), firm profitability (Profit), firm credit ratings from S&P (Rating), age of the debt (Age), a high yield dummy (HighYield) that takes on a value of 1 if the firm has non-investment grade debt, and predicted firm leverage (Leverage). Second stage of regressions are presented below. In columns (3) and (5) GIndex is orthogonalized with respect to CEO ownership and residuals are used in the regression. In columns (4) and (6) CEO ownership is instrumented on CEO age and CEO tenure. In all regressions leverage is obtained from first stage regressions, where leverage is regressed on variables described in Table 3. Firm and year dummies are included to control for fixed effects. Heteroscedasticity adjustment is used for estimating standard errors. Statistics on instrument sets are presented. The labels ^{a, b, c} denote significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	0.457 ^a (3.27)	0.304 ^b (2.50)	0.273 ^b (2.45)	0.272 ^a (2.6)	0.191 ^b (2.42)	0.258 ^b (2.47)
Size	-0.064 ^a (4.88)	-0.044 (-1.53)	-0.046 (-1.60)	-0.055 ^a (-2.76)	-0.063 ^a (-4.52)	-0.069 ^a (-3.18)
Profit	-0.166 (1.15)	-0.686 (-1.54)	-0.663 (-1.49)	-0.404 ^a (-3.62)	-0.440 ^a (-5.72)	-0.439 ^a (-3.22)
Rating	-0.035 ^a (9.70)	-0.046 ^b (-2.44)	-0.045 ^b (-2.36)	-0.042 ^b (-2.05)	-0.030 ^a (-5.06)	-0.059 ^b (-2.19)
HighYield	0.064 ^a (3.95)	0.065 ^b (2.46)	0.064 ^b (2.41)	0.042 ^b (2.02)	0.049 ^a (2.86)	0.052 ^c (1.86)
Debt Age	0.009 ^a (6.69)	0.008 ^a (3.40)	0.008 ^a (3.44)	0.016 ^a (6.88)	0.009 ^a (6.49)	0.020 ^a (4.04)
Volatility	-0.007 (1.37)	0.013 ^b (2.16)	0.013 ^b (2.11)	0.017 ^b (2.17)	0.011 ^b (2.19)	0.004 ^b (2.06)
GIndex	-0.007 ^b (2.10)		-0.001 ^c (-1.75)	-0.004 ^c (-1.85)	-0.002 (-1.52)	-0.013 (-1.47)
Blockholder		0.138 ^b (2.20)	0.135 ^b (2.19)	0.132 ^b (2.48)	0.370 ^a (2.76)	0.374 ^a (2.32)
CEO		-0.277 (-1.11)	-0.270 (-1.09)	-0.264 (-1.18)	-0.273 (-1.23)	-0.236 (-1.28)
CEO2		0.661 (1.18)	0.643 (1.16)	0.492 (1.12)	0.607 (1.32)	0.326 (1.41)
GIndex*CEO					0.639 (1.62)	0.266 (1.28)
GIndex*CEO2					-1.527 ^c (-1.89)	-0.443 ^c (-1.92)
GIndex*Blockholder					-0.026 ^b (-2.00)	-0.074 ^b (-2.20)
Adjusted R-Squared	0.209	0.279	0.281	0.261	0.309	0.311
Observation	2,570	2,570	2,570	2,509	2,570	2,509
Overidentifying restrictions						
Basmann test p-value	0.24	0.28	0.28		0.33	
Hansen's J stat p-value				0.398		0.446
Partial R square:				0.114		0.112
CEO ownership				0.129		0.126
Leverage						0.106
GIndex*CEO ownership						
F statistics:				12.47 ^a		
CEO ownership				13.98 ^a		9.51 ^a
Leverage						10.38 ^a
GIndex*CEO ownership						8.58 ^a

Table 5
Alternative Specifications: Robustness and Bond Covenants

This table gives the estimated coefficients of the market value of firm leverage and yield spread (in basis points) explained by the corporate governance variables, a covenant index, and control variables. The data covers the period 1990 through 2000. Bond covenant variables include: covenant index (CovIndex), and variables used to gauge the interactions between CovIndex and CEO ownership, CEO ownership squared, and blockholders. Deficit is ratio of net debt plus net equity to total assets. Firm specific control variables and governance variables used are as explained in Tables 3 and 4. Firm level control variables are similar to those presented in Table 3 and Table 4 and are omitted from the table. Heckman sample selection bias is controlled in leverage in column (1). Changes regressions are based on first difference results. Firm and year fixed effects are controlled. The variables for changes regressions models are based on changes in variables with year dummies. In columns (1), (4) and (6), GIndex is orthogonalized on CEO ownership and residuals are used. In columns (5) and (7), CEO ownership is instrumented on CEO age and CEO tenure, and covenant index is instrumented on depreciation and intangible assets. In spread regressions, leverage is obtained from first stage regressions where leverage is regressed on variables given in Table 3. Heteroscedasticity adjustment is used for estimating standard errors. In parenthesis, t-statistics are given. Statistics on instrument sets are presented. The labels ^{a, b, c} denote significance at the 1%, 5%, and 10% level, respectively.

	<u>Heckman</u>	<u>Changes Regressions</u>		<u>Bond Covenants</u>			
	Leverage	Leverage	Spread	Leverage	Leverage	Spread	Spread
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Deficit		0.348 ^a (32.6)					
GIndex	0.003 (1.18)	0.0004 (1.25)	-0.018 (1.98) ^b	0.008 ^b (2.20)	0.007 (2.13)	0.002 (0.51)	0.024 (0.40)
Blockholder	0.063 (0.88)	-0.016 (-0.40)	0.172 ^c (1.95)	0.223 ^c (1.68)	0.418 (1.32)	0.0467 ^a (3.99)	0.044 (2.71)
CEO	-0.534 ^a (-3.20)	-0.271 ^b (-2.08)	-0.54 ^c (1.73)	-0.437 ^a (4.89)	-0.525 ^b (2.30)	-0.404 (-1.32)	-0.426 (-1.57)
CEO2	0.763 ^a (2.70)	0.329 (1.62)	0.4154 (0.57)	0.493 ^a (2.73)	0.739 (2.79)	0.147 (1.52)	0.289 (1.39)
GIndex*CEO	0.557 ^b (2.47)	0.027 ^c (1.73)	0.424 (1.26)	0.513 ^a (3.55)	0.601 (2.79)	0.363 (0.97)	0.146 (0.63)
GIndex*CEO2	-0.947 ^b (-2.04)	-0.036 ^c (1.68)	-0.046 (1.47)	-0.885 ^b (-2.51)	-0.766 ^c (1.89)	-0.078 (-1.23)	-0.202 (-1.31)
GIndex*Blockholder	-0.004 (-0.59)	0.001 (0.14)	-0.112 ^c (1.88)	-0.007 (-1.52)	-0.033 (-1.25)	-0.167 ^a (-2.73)	-0.014 (-2.20)
CovIndex				0.008 (1.54)	0.018 (1.30)	0.001 (0.24)	0.016 (1.29)
CovIndex*CEO				0.001 (0.11)	0.016 (1.11)	0.221 (1.54)	0.140 (1.47)
CovIndex*CEO2				0.001 (0.22)	-0.036 (-1.45)	-0.085 ^c (-1.74)	-0.071 (-1.79)
CovIndex*Blockholder				-0.062 (-1.30)	-0.087 (-1.37)	-0.159 ^a (-2.75)	-0.134 (-2.06)
Adjusted R-Squared	0.115	0.150	0.280	0.141	0.136	0.321	0.295
Observations	11,011	9,584	1,128	6,478	5,494	2,150	2,053
Inverse Mill's Ratio	0.074 (1.46)						
Overidentifying restrictions							
Basmann test p-value			0.21			0.43	
Hansen's J stat p-value					0.524		0.461
Partial R-square:							
CEO ownership					0.139		0.126
Covenant Index					0.126		0.114
GIndex*CEO ownership					0.111		0.108
Covenant*CEO ownership					0.114		0.132
Leverage							0.154
F statistics:							
CEO ownership					11.54 ^a		10.75 ^a
Covenant Index					10.28 ^a		10.84 ^a
GIndex*CEO ownership					10.17 ^a		11.67 ^a
Covenant*CEO ownership					11.62 ^a		13.79 ^a
Leverage							11.91 ^a