Bond Covenants and Investment Policy

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Abstract

I provide evidence that covenants in bond indentures affect firms' investment policy outside of covenant violations. Using a large dataset of public bonds, and controlling for the self-selectivity of covenant inclusion, I find that bonds with investment (financing) restrictions are associated with a decrease (increase) in investment in the two years following the issue. The effect of investment restrictions is entirely driven by firms that are more financially constrained. Both financially constrained and unconstrained firms have significantly higher investment spending after issuing a bond with financing restrictions, although the magnitude of the effect is higher in the latter group. These findings suggest that while bond covenants can help mitigate agency problems and reduce the cost of debt, they may also have externalities that lead to more investment distortions in firms that are closer to financial distress. This paper is the first to document a positive relationship between a covenant restriction and ex-post investment.

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1 Introduction

How do restrictive covenants in bonds affect investment policy ex-post? Although covenants are ubiquitous in debt contracts, we still have limited empirical evidence on how different types of covenants affect firms' investment policy. Most empirical studies have looked either at the likelihood of including covenants given a firm's growth opportunities or at what happens to investment once a covenant is violated. By contrast, this paper investigates firms' investment behavior in the years following the issuance of bonds that include covenants with restrictions on investment or financing activities. Because covenant violations are less frequent with public bonds due to the very high cost of renegotiation, this paper focuses on public bonds to flush out the ex-post effect of covenant inclusion before any violation occurs.

The costly contracting hypothesis, stemming from the work of Jensen and Meckling (1976), Myers (1977), and Smith and Warner (1979) provide the main theoretical framework for the inclusion of covenants in debt contracts. Managers of a levered firm, acting on behalf of shareholders, have an incentive to adopt investment, financing and dividend policies that maximize the value of equity rather than the value of the firm. Rationale bondholders anticipate these agency conflicts and impose the entire expected cost to the firm in the pricing of debt. Because stockholders bear the full costs of agency conflicts, they have an incentive to minimize these costs. The theory argues that restrictive covenants are effective instruments in mitigating these agency conflicts by aligning the interests of managers with those of bondholders. By agreeing to these restrictive covenants, shareholders can reduce agency costs and thus the cost of debt. However, these restrictions impose limitations on managerial actions and thus can have a negative effect on profitability as managers might be unable to undertake optimal investment decisions in certain states of the world because of limited flexibility (Jensen and Meckling, 1976). Shareholders agree to restrictive covenants when the expected cost (loss of flexibility) is less than the expected profit (lower cost of debt).

The costly contracting hypothesis implies therefore that firms' investment and financial policies are affected by the covenant restrictions on their issued debt. However, most studies on the role and purpose of covenants have focused on ex-ante firms characteristics to try and understand which firms are more likely to include a specific type of covenants. The question of how firms behavior change depending on the type of restriction in their debt contract is still largely unexplored. Studies by Chava and Roberts (2008) and Nini et al. (2009) show that after a violation or a deterioration of credit quality, covenant restrictions lead to lower capital expenditure. These studies highlight the monitoring role of private lenders who use the threat of recalling the loan to intervene with management. In this paper, I look at the effect of covenant restrictions that is not due to any creditor intervention. Bond creditors are more dispersed and have little influence on management. The cost of violating a covenant is higher for bonds since renegotiation rarely occurs outside of bankruptcy. These characteristics make bond contract ideal to studying the effect of covenant outside of technical default.

The primary challenge when attempting to determine the causal effect of covenant restrictions on investment policy is that covenant choice is not exogenous. Managers anticipate these effects when making their financing decisions. To address the endogeneity of covenant inclusion, I use a two-stage estimation method. Ziliak and Kniesner (1998) and Wooldridge (2002) show that under the assumption of normality, adding the inverse Mills ratio from the first stage selection model to the differenced equation in the second stage results in a consistent estimation. Following several studies that estimate the likelihood of covenant inclusion (Malitz, 1986; Begley, 1994; Nash et al., 2003; Billett et al., 2007; Reisel, 2014), I estimate a first stage probit regression using firms and loan characteristics. From this regression, I obtain the inverse Mills ratio, with which I augment a traditional q model of investment.

The analysis focuses on two groups of covenants: restrictions on investment and financing activities. I find that following a bond issuance, firms with a covenant restricting investment have lower capital expenditures relative to those firms that do not have the covenants in

their bond contracts. However, this effect is entirely driven by firms that are more financially constrained. Since these firms are also more likely to overinvest in risky assets, these results may suggest that covenant restricting risky investment are effective at mitigating the agency problems of overinvestment and asset substitution. I also find that covenant restricting financing activities have an externality on investment policy. Following the issuance of bonds, firms with financing restrictions have higher capital expenditures than firms without those covenants. Both financially constrained and unconstrained firms have significantly higher investment spending after issuing a bond with financing restrictions, although the magnitude of the effect is higher in the latter group. These results may suggest that issuing bonds with only financing restrictions help lower the cost of debt, which allows firm to undertake more investment, but it might also exacerbate the overinvestment problem in firms that are closer to financial distress.

This paper contributes to the literature on the role of covenant in public bonds. Some researchers argue that covenants in bond indentures are boilerplate contracts and have no effect on the firms. Kahan and Yermack (1998) argue that the absence of covenants in publicly traded convertible bonds is a proof that convertibility is a more effective mechanism to mitigate agency problems linked to investment policies in public debt. Verde (1999) contends that bond covenants are written loosely and offer very little protection to bondholders when compared to covenants in private loan agreements. Within this view, covenants in bonds should have no impact on the firm's behavior, and creditors should rely on other mechanisms to resolve the agency conflicts. This paper shows that covenants in bond affect investment behavior. It shows that while covenants in public bonds can mitigate agency problems, they can also exacerbate investment distortions.

This paper is also related to studies that investigate the agency costs of debt and their consequence for investment policies. Because the primary purpose of covenants in bond is to alleviate agency problems, several studies have looked at the role of covenant in mitigating investment distortions. Secured debt, leasing, dividend restrictions can alleviate the

underinvestment problem (Smith and Warner, 1979; Kalay, 1982; Stulz and Johnson, 1985; Smith and Wakeman, 1985) but can also increase overinvestment (Berkovitch and Kim, 1990). This paper document a positive relationship between covenants restricting financing activities, which includes restrictions on the issuance of additional debt and negative pledge covenants, and investment. However, I cannot conclude if the observed behavior is reducing underinvestment or increasing overinvestment.

Finally, this paper contributes to the literature on financial frictions in the debt market and their impact on investment. Whited (1992) and Hennessy (2004) use structural econometric models to show that financially unhealthy firms have difficulty obtaining external finance, which results in lower investment. Lang et al. (1996) show that high leverage negatively impacts investment. Whited (2006) show that external financing constraints affect the timing of large investment projects. The findings in this paper are consistent with these previous studies and suggest that the terms of the bond contract affect the timing of investment. On one hand, firms that issue bonds with covenant restricting investment activities are also more likely to be financially constrained. These firms may be agreeing to the restrictions and delaying investment because they are unable to obtain adequate financing. On the other hand, firms that issue bonds with covenant restricting financing activities may have higher level of investment because they are able to lower the cost of debt, which enables them to undertake investment sooner.

2 Motivation and Literature

2.1 Motivation

The main theoretical framework that we have for understanding the purpose and implication of covenants stems from the work of Jensen and Meckling (1976), Myers (1977), and Smith and Warner (1979). Jensen and Meckling define the concept of agency costs of debt

and its effect on firm's value. Myers extend the model to show that levered corporation with growth options have an incentive to underinvest. Finally, Smith and Warner show how covenants are included in bond contract in order to reduce the agency cost. The Costly Contracting Hypothesis posits that bond covenants can increase the value of the firm by reducing the opportunity loss that results from the fact that stockholder's in a levered firm have an incentive to adopt equity value maximizing rather than firm value maximizing policies. Smith and Warner (1979) argue that covenants reduce the agency costs of debt and that the benefits accrue to the firm's owners. However, covenants also impose direct and opportunity costs that are substantial and explain the observed heterogeneity in debt contracts. Only firms that expect the cost-reducing benefits of covenants to exceed the costs associated with their restrictions will agree to have covenants included in their debt contracts.

Most studies on the role of covenants focus on ex-ante firms' characteristics to explain the observed heterogeneity in covenant choice. Malitz (1986) finds that the presence of covenants in public debt is negatively related to the size of the firm and positively related to the firm's leverage. Begley (1994) finds that firms with a higher probability of bankruptcy, less assets in place, and generating less cash flow from operations are more likely to include covenants restricting dividends and additional debt in bonds contracts. Growth opportunity is negatively (Kahan and Yermack, 1998; Nash et al., 2003; Reisel, 2014), positively (Billett et al., 2007; Bradley and Roberts, 2015) correlated with covenant inclusion. Chava et al. (2010) show that managerial entrenchment and the risk of managerial fraud significantly impact the choice of bond covenants. These studies show that ex-ante firms characteristics affect the choice of covenants in public and private debt, providing support for the costly contracting hypothesis.

However, the question of how firms characteristics are affected ex-post by covenant choice remains largely unexplored. More specifically, there is insufficient empirical evidence on the direct and indirect consequences of covenants on firm's investment policy despite theoretical predictions on the externality of covenants on investment policy. Brennan and Schwartz

(1984) build a theoretical model of firm's financing and show that in the presence of financial frictions, firms with low levels of profitability and leverage that issue bonds with covenants restricting debt issuance have a higher level of investment than if they issued the bond without covenants. This shows that while the purpose of financing restrictions is to prevent wealth expropriation through claim dilution, the covenants can have an externality on investment policy. While Brennan and Schwartz (1984) analysis does not claim that the externality is good or bad for firm's value, several studies support the idea that covenants restricting financing activities can have indirect consequences on investment policy. Stulz and Johnson (1985) and Smith and Wakeman (1985) show that secured debt and leasing can alleviate the underinvestment problem. Smith and Warner (1979) and Kalay (1982) show that dividend restrictions might help alleviate the underinvestment problem. Berkovitch and Kim (1990) show that senior debt and debt with dividend covenants may decrease underinvestment while increasing overinvestment. Hennessy (2004) show that the issuance of additional secured debt can mitigate underinvestment stemming from debt overhang. These results suggest that including covenants in bonds that restrict financing activities can have an impact on investment policy.

2.2 Related Literature

Few studies look at the ex-post effect of covenants on investment, and those studies usually look at the effect after a technical default or a deterioration of credit quality. Looking at a sample of private loans, (Chava and Roberts, 2008) examine the effect of violation of financial covenants such as minimum net worth and current ratio on investment. Exploiting a discontinuity around the covenant threshold, they are able to show that capital expenditure declines sharply following a covenant violation. This decline is higher for firms with relatively larger agency and information problems. Also using a sample of private loans, (Nini et al., 2009) find that capital expenditure restrictions reduce firms' investment and that these

restrictions are more likely to be put in place after credit quality deteriorates, which may suggest that these firms have already violated a covenant. Both of these studies provide support for the role that financial covenants play in the contingent allocation of control rights; after violation, creditors use the right to recall the loan to intervene in firm's management. In contrast to these studies, I focus on the ex-post effect of restrictive covenants in public bonds on investment expenditure, outside of violation. Restrictive covenants differ from financial covenants in that they impose a limitation of managerial action, while financial covenants impose threshold on accounting ratios that are volatile and not under the full control of managers. Financial covenants are less prevalent in public bonds because the high number of dispersed investor reduces the incentive to monitor and renegotiation rarely occurs outside of bankruptcy.

Other studies look at the ex-post effect of covenants on various firms performance. Demiroglu and James (2010) find that following the issuance of loans with tight covenants, the accounting ratios associated with the covenant improve while investment expenditure and net debt issuance decreases. They also focus their analysis on the ex-post effect of covenants outside of default and show that tight financial covenants are correlated with lower level of investment. In this paper, I extend a similar analysis to bond covenants to further our understanding in the difference of covenants in private and public debt. Cook and Easterwood (1994) examine the effect of poison put covenants in bonds and find a negative effect of stockholders wealth but a positive effect on the wealth of bondholders. Spyridopoulos (2018) show that stricter loan covenants lead to higher profitability and lower operating costs, but the effect is driven only by firms with poor governance, providing support for the disciplining role of debt. Asquith and Wizman (1990) show that public bonds with strong covenant protection gain value in leveraged buyouts while those with no protection lose value. These studies show issuing debt with covenants affect firm's value in the long run. This paper extend this literature by showing that restrictive covenants in public bonds can also results in unanticipated impact, from the agency theory perspective, on investment behavior.

3 Data and Sample Characteristics

3.1 Data Sources

The data comes from 2016 Fixed Investment Securities Database (FISD) for bond data, Compustat annual files for firm's financial statement data, CRSP monthly stock data for market value, and the Federal Reserve bank of St Louis (FRED) for secondary yields on the Treasury and corporate bonds required to compute term and credit spreads respectively. FISD contains various information on the covenants associated with a bond at the time of issuance for a large set of firms.

Following Billett et al. (2007) and Reisel (2014), I only consider public bonds issued by U.S. domiciled non-financial companies that are in U.S. dollars. I exclude Yankee, Canadian, foreign currency, and government and utilities companies bonds. In addition, I exclude all bonds for which covenant information, subsequent data from prospectuses or other detailed sources, offering yield, offering date, maturity date, or security level are not available. Finally, I exclude medium term notes (MTN), private placements, and bonds with rule 144a. The final sample is in the intersection of FISD, CRSP and Compustat during 1989-2015 and includes 4221 bonds issued by 1005 firms. I winsorize firm and bond data at the 1% and 99% levels to alleviate the effect of outliers.

3.2 Key variables

The investment variable is $CAPEX$, which is the ratio of capital expenditure to the start of period assets. In all the regression, the dependent variable is the change in capital expenditure, $\delta CAPEX$, after the bond is issued relative to the year prior to the bond issuance. I investigate the change in investment expenditure in the first and second fiscal years after the fiscal year in which the bond is issued. The two specifications attempt to shade a light on what happens to investment over time after a firm issue a bond with a

covenant relative to if the it had issued the bond without the covenant.

Bond covenants are provisions in the bond contract that impose restrictions on the issuer once the bond is issued. I use the framework provided by Smith and Warner (1979) to group covenants into primary categories based on the nature of the restriction, with a focus on covenants that restrict investment and financing activities. Appendix A provides more details on the specific covenants in each category. *Investment restrictions* are covenants that either directly restricts risky investments or do so indirectly by imposing restrictions on the firms dealings with it subsidiaries, and on the acquisition and sale of assets. There are 12.4% of bonds that are issued with a restriction on investments.

Financing restrictions include covenants on the issuance of additional debt, sale-leaseback transactions, and negative pledge. 19.4% of the bonds include restrictions on the issuance of additional debt which restricts the seniority and the amount of debt that the firm can incurred as well as impose leverage and net earnings test that must be met before the firm can issue any new debt. Restrictions on sale-leaseback activities are present in 61.7% of the sample and restrict the firm to the type and amount of property used in a sale-leaseback transaction. 70% of the bonds include a negative pledge covenant that requires the firm to issue secured debt only if it secures the current issue on a pari passu basis. In total, 81.2% of bonds include restrictions on financing activities.

3.3 Firms characteristics and covenant inclusion

Table 1 presents some summary statistics for the whole sample (All) as well for the subsamples of loan with and without the indicated category of covenants; restrictions on investment or on financing activities. The values under columns "Yes" and "No" represent the sample mean of the corresponding variable, and the value under column "T-DIF" is the t-value of the difference in the means of the two subsamples. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. The table shows

significant heterogeneity between firms that issue bonds with covenant restrictions and those that issue without. The data shows that the yield is higher for bonds with covenants. Bradley and Roberts (2015) and Reisel (2014) show that covenant inclusion leads to a reduction of the price of debt. Put together, the results from the table suggests that the yield would have been even higher if those bonds did not include a covenant. The data also shows a negative relation with covenant and bond maturity. This may suggests that in bonds, restrictive covenants and maturity are complement and not substitute. However a more formal analysis is required before drawing conclusions.

The data in Table 1 shows that firms that issue bonds with restrictive covenants are on average smaller, where size is measured by the log of book assets. Firms without an investment restriction are approximate 6.5 times larger than firms with the restriction. The data also shows a negative relation between covenants and firm's growth option (Q), as measured by market-to-book, and with cash on hands, but a positive relation with leverage. These are consistent with the agency theory of debt. The theory predicts that firms that are closer to financial distress are more likely to include restrictive covenants in their debt contract. Cash flow, profitability, dividend payments, and age are negatively related to investment restrictions, but positively correlated with restrictions on financing activities. Asset tangibility, cash flow volatility, KZ index which indicates a firm's relative level of financial constraint are positively (negatively) correlated with investment (financing) restrictions. Finally, credit spread has a negative (positive) relation with investment (financing) covenants, suggesting that firms are more likely to agree to covenants that restrict their investment decisions, but not future financing when the risk premium is low.

4 Ex-Post Effect of Restrictive Covenants

4.1 Empirical strategy

The non randomness of covenant inclusion introduces a significant identification problem when trying to measure the impact of the restriction on firm investment. The costly contracting hypothesis predicts that borrowers weight the costs and benefits of restrictive covenants when making decisions. Thus there exist some unobservable firm characteristics that affect both investment policy and covenant selection. To control for the endogeneity of covenant inclusion dummy, I follow the two-step estimation methodology similar to the one used by Goyal (2005) and Reisel (2014). In the first stage, I estimate the probability of covenant inclusion using a reduced form probit.

$$Cov_t = \Gamma Z_{t-1} + \eta_t \tag{1}$$

where Cov is a dummy variable that equals 1 if the bond contains the restrictive covenant, Z is a set of variables that affect the decision to include the covenant in the bond contract, and η is a random error with mean zero and a normalized variance of 1. Under assumption of normality, I obtain from the equation (1)the estimates of the inverse Mills ratios that equal $\phi(\hat{\Gamma}Z)/\Phi(\hat{\Gamma}Z)$ for bonds with covenants and $-\phi(\hat{\Gamma}Z)/[1-\Phi(\hat{\Gamma}Z)]$ for bonds without covenants. ϕ is the standard normal density function and Φ is the standard normal cumulative distribution function.

In the second stage, I estimate a traditional investment equation with the covenant dummy and the inverse Mills ratio as explanatory variables

$$\Delta CAPEX_{t+1} = \beta_0 \, Cov_t + \alpha_0 \, IMR_t + \beta_1 \, \Delta X_{t-1} + \varepsilon_{t+1}. \tag{2}$$

$\Delta CAPEX$ is the change in capital expenditure relative to its value before the bond was

issued, X is a vector of control variables. Ziliak and Kniesner (1998) and Wooldridge (2002) show that under assumption of normality, adding the inverse Mills ratio from the probit regression to the differenced equation results in consistent estimation.

The motivation for the specification in equation (2) comes from the theory and empirical work. Classical q theory implies that investment is only a function of marginal q, which is unobservable. However several works such Hennessy (2004) and Bakke and Whited (2010) show that empirical proxies of marginal q along with additional control variables such as cash flow, size, and leverage are effective in addressing a potential omitted variable issue in the investment regression. The difference-in-difference approach accounts for time-invariant unobservable differences between firms that issue bonds with covenants and those that do not. The parameter of interest is β_0, which represents the impact of a covenant inclusion on investment (i.e. the treatment effect). The coefficient of the inverse Mills ratio, α_0 captures the correlation between the error terms ε and η

4.2 Primary Results

4.2.1 Covenant selection

The covenant selection model is based on the theory and empirical evidence on the factors that affect covenant inclusion in a debt agreement. I use firms and bond characteristics, and macroeconomic factors to determine the likelihood of covenant inclusion. According to the Costly Contracting Hypothesis, firms that are associated with higher agency costs are more likely to have covenants included in their debt contracts. In line with this theory, size and leverage (Malitz, 1986), growth option (Nash et al., 2003; Billett et al., 2007), the proportion of tangible assets and cash flow (Begley, 1994) are firms characteristics associated with the likelihood of covenant inclusion. Following Reisel (2014) I also include company credit ratings since they may provide additional information about firm performance. Because other loan characteristics can be used to mitigate agency costs (see Nash et al., 2003, for a discussion), I

include the bond's maturity and amount, and dummies for putable, callable, and convertible features. Following Bradley and Roberts (2015) I control for macroeconomic factors using the difference between the 10-year and 1-year treasury bonds (Term Spread) and the difference in the yields on BAA and AAA corporate bonds (Credit Spread). Since agency costs may vary across industries, I include dummies for one-digit sic codes in all the regressions.

Table 2 reports the results of the probit model for the probability of including a covenant in the bond contract. The results of this estimation are used to estimate the inverse mill ratios use in the investment regression. Consistent with previous findings, firm size is negatively correlated with covenant inclusion. The coefficient on market-to-book has a negative sign, but is only statistically significant for investment restrictions. This suggests that firms with high growth options may find covenant restricting investment very costly, but not those restricting financing activities. Firms with more tangible assets are more likely to have investment restrictions but less likely to have financing restrictions in their bond indenture. One of the strongest determinant of covenant inclusion is convertibility, as indicated by the t-statistics on the coefficient. The negative sign suggest that restrictive covenants and convertibility might be substitute in addressing agency conflicts.

4.2.2 Investment restrictions

Table 3 presents the estimation results of the investment regression for covenants restricting investments. All specifications include year fixed effects. In Panel A the dependent variable is the change in capital expenditure one year after the bond is issued relative to the year before the issuance. In Panel B the dependent variable is the change two years after. In all specifications, the coefficient on the inverse mills ratio is positive and significant. This implies that I can reject the null hypothesis that there is no self selection bias. The positive sign on the inverse Mills ratio suggest that unobservable firm characteristics that increase the likelihood of the inclusion of covenant restricting investments are positively correlated with an increase in investment spending. According to the costly contracting hypothesis, the

purpose of investment restrictions in bond indenture is to mitigate the agency risk of over-investment in risky assets (Smith and Warner, 1979). The positive and significant sign on the inverse Mills ratio suggest that covenant restricting risky investment in bond indentures might be effective at mitigating the agency cost of asset substitution and overinvestment. It also implies that it is important to control for the endogeneity of the covenant decision when investigating the effect on firm's policies.

Consistent with previous findings that restrictions on investment lead to lower investment expenditure, I find the coefficient on the covenant dummy is always negative and significant after controlling for the self selection bias. Using the specification in column (4) that includes all control variables, I find that in the first year following the year of the bond issuance, the change in the proportion of capital expenditure to assets is 1.17 percentage points lower for firms with investment restrictions relative to those firms without the restriction. Given the average capital expenditure of 8% of assets prior to the security issuance, this correspond to a difference of almost 15%. In the second year following the issuance, the difference is even more substantial. Firms with investment restriction have a capital expenditure 1.58 percentage points lower than firms without the covenant, which correspond to a difference of 20% relative to the average capital expenditure in the year before the bond is issued. This results show that the effect of investment restrictions on capital expenditure is economically significant and persistent. The coefficient estimates on cash flow, Tobin's Q, size, and leverage are consistent with previous studies examining capital expenditures.

4.2.3 Financing restrictions

Table 4 reports the estimation results of the investment regression for covenants restricting financing activities. In Panel A (B) the dependent variable is the change in capital expenditure one (two) year after the bond is issued relative to the year prior to the issuance. The inverse mills ratio is significant at the 1% level in all the specifications, indicating the prevalence of self selection in the decision to include financing restrictions in the bond

contract. The negative sign on the selectivity variable suggests that firms with a higher probability of issuing bonds with restrictions on financing activities are also more likely to reduce capital expenditure. The purpose of financing restrictions is to prevent wealth transfer through claim dilution. However, the presence of financial frictions create a link between financing and investment activities. One possible reason for the negative sign on the inverse Mills ratio is that these firms have liquidity constrains ex-ante and would not have been able to undertake additional investment without issuing the bond. Another possible explanation is that these firms are more likely to underinvest. Mauer and Ott (2000) show that a levered firm tend to underinvest when shareholders must bear the full cost of new investment while sharing the profits with bondholders. This analysis does not distinguishes between both explanation, but simply suggest that these firms are more likely to reduce investment.

In all the specification in table 4, the coefficient estimates on the financing restrictions dummy is positive and significant at the 1% level after controlling for the selection bias. The results are also economically significant. Firms that issue bonds with covenant restricting financing show capital expenditure of 2.32 percentage point higher than firms without the covenants. This difference correspond to 29% of the average investment spending in year prior to the bond being issued, using specification in column (4). In the second year following the year of the bond, the change in investment spending for firms with financing restriction is 3.89 percentage points higher, which correspond to 49% of th capital expenditure spending in the year prior to the bond issuance. These results suggest that after issuing bonds with only financing restrictions, firms are able to undertake more investment relative to those firms that issue bonds without these covenants. These results are consistent with the theoretical prediction of the model by Brennan and Schwartz (1984). A possible explanation for the observed behavior is that agreeing to the restrictions allows firm to reduce the cost of debt and thus undertake more investment. Another possible explanation is that these firms are financially constrained and are more willing to gamble with the new influx of cash. Since they don't have investment restrictions, they overinvest in risky investment. My analysis

does not differentiate between these possible explanations.

4.3 Robustness

For robustness purpose, I also perform a counterfactual analysis of the effect of covenant inclusion on ex-post investment in the second stage. I estimate the investment regression, with the appropriate inverse Mills ratio, separately for firms with and without the covenants. Using the estimates from these regression excluding the inverse Mills ratio, I obtain two sets of predicted capital expenditure for the whole sample: one corresponding to loans with a particular covenant and the other corresponding to loans without the covenant. I am thus able to estimate a counterfactual for each loan in the sample. Table 5 reports the average value of the predicted capital expenditure with and without investment restrictions, and their difference. On average, investment spending decrease in the years following the bond issuance. However, the decrease is larger if the bond contains restrictions on investment activities. The difference is statistically and economically significant. In the first year following the bond, the difference is 1.2 percentage points and 2.15 percentage point in th second year. These difference correspond to 15% and 27% of the average capital expenditure in the year prior to the bond, respectively. These results implies that after controlling for the self selection of covenant inclusion, firms that issue bonds with investment restriction will see a larger decrease in investment spending relative to if they had not agreed to the restriction.

Table 6 show the same results for loans with and without financing restrictions. While investment spending decrease in the years following the issuance of the bond relative to the year prior to the issue, the decrease is much larger when the firm issues bond without financing restrictions. The difference in change in capital expenditure is 2.27 and 3.56 percentage points in the first and second year respectively. These values correspond to 29% and 45% of the average capital expenditure in the year preceding the bond issue. Thus similar to the results in previous section, firms that issue bonds with financing restrictions are able

to invest more in the following years relative to if they had issue the bond without the covenants. Again this could be that these firms are able to reduce the cost of debt which allows them to invest more, or it could be that they are taking on more risky investment in order to maximize their expected returns. In the next section, I investigate how this effect differ among firms with different level of financial constraints.

5 Cross-Sectional Variations

In this section I test whether the ex-post effect of covenants on investment covary with the ex-ante financial health of the firm using several proxies for financing constraints. This is important to further understand what is driving the investment response to the inclusion of restrictive covenants.

5.1 Proxies for financial constraints

I examine four different proxies for financial constraints. The first proxy is the age of the firm as measured by the number of years in Compustat. Since younger firms are more likely to face more frictions in capital-markets, firm age can be used as a proxy for financial constraints (Hovakimian and Titman, 2006; Almeida and Campello, 2007). If a firm has a higher probability of investing in negative net present value project with a high upward potential, the agency cost will be higher for a younger firm relative to an older firm. In this case, younger firms that issue bonds with restrictive covenants on investment should see a larger decrease in capital expenditure. On the other hand, younger firms are less likely to underinvest and thus should see a smaller impact on investment after issuing bonds with financing restrictions.

The second proxy is the proportion of assets held in cash. Financial slack has been associated with financial constraints by many researchers. Some have argued that firms accumulate more cash when they expect higher cost of external financing (Fazzari et al.,

2000; Almeida et al., 2011). However, others argue that firms with large cash balance are not financially constrained since it is an indication that investment is not limited by an availability of internal funds (Kaplan and Zingales, 1997). Although the evidence supports the fact that cash holdings are more valuable for constrained firms, Denis and Sibilkov (2010) also show that some constrained firms exhibit low level of cash holdings due to persistent low cash flow. In our sample firms that issue bond with investment restrictions are younger with higher leverage, lower cash flow, lower profitability, higher cash flow volatility, lower dividend payout ratio, higher KZ index and lower cash flow. This suggest that these firms are financially constrained. I expect then that firms with lower cash balances that agree to restrictions on investment are more likely to overinvest and thus should see the larger decrease in investment. On the other hand, firms with larger cash balances that agree to financing restrictions should display more sensitivity to covenant inclusion since these firms are more likely to delay investment.

The third proxy is the dividend payout ratio. I classify firms in three groups following Fazzari et al. (1988). Several studies have linked a firm's payout ratio to financial constraints (Alti, 2003; Almeida and Campello, 2007). Firms that have a higher earnings retention rate display excess sensitivity of investment to internal funds. The higher retention rate suggests that these firms face steeper cost of external finance and must rely on internally generated cash flow to fund investments. The response of investment to covenant for lower and higher dividend firms is the same as for cash holdings. The final proxy is the KZ index based on the work of Kaplan and Zingales (1997). The synthetic index is constructed following several authors who have used it to classify firms as financially constrained or not (Baker et al., 2003; Bakke and Whited, 2010). Firms with higher values are considered financially constrained. In so far as the constraints is caused by the agency conflicts, more financially constrained firms should see the stronger effect after covenant inclusion.

5.2 Test of cross-sectional variations

To test for the hypotheses of cross sectional variations in investment response, I augment the model in equation (2) by interacting all the variables with a proxy of financing constraints. The specification follows Chava and Roberts (2008) and provides a more straightforward test to compare the two main coefficients of interest. The empirical model is

$$\begin{aligned}\Delta CAPEX_i = \beta_0\, I_{(A)} Cov_i + \beta_1\,(1 - I_{(A)}) Cov_i + \alpha_0\, I_{(A)} IMR_i \\ + \alpha_1\,(1 - I_{(A)}) IMR_i + \Gamma_0\, I_{(A)} \Delta X_i + \Gamma_1\,(1 - I_{(A)}) \Delta X_i + \varepsilon_i, \quad (3)\end{aligned}$$

where $I_{(A)}$ is an indicator function equal to one if the event A is true, and zero otherwise. The indicator function correspond to one of the proxy discussed above and is measured at the end of the fiscal year preceding the bond issuance. The coefficients of interest are β_0 and β_1 which correspond, respectively, to the interaction of the covenant dummy with $I_{(A)}$ and $(1 - I_{(A)})$. The first represent the effect of covenant inclusion on the investment of firms that are financially constrained and the second the effect for firms that are financially unconstrained. In all the regressions, X_i is a vector of covariates that include *Cash Flow, Tobin's Q, Leverage*. I also include year fixed effects.

To construct the dummy variable for financially constrained firms, I divided the sample in three for each proxy. Firms in the lower (upper) third of the distribution for age and cash holdings are considered financially constrained (unconstrained). Firms that pay less than 10% of their income are classified as low dividend firms and firms that pay more than 30% are considered high paying firms. Firms that have negative payout rate because of reported negative earnings are also considered high dividend paying firms since by definition they are paying more than 100% of their earnings. Low (high) dividend paying firms are considered financially constrained (unconstrained). Finally, firms in the higher(lower) third of the distribution for KZ index are considered financially constrained (unconstrained).

Table 7 display the results of the analysis for covenant restricting investment activities. I only display the estimated coefficients and t-statistics of β_0 and β_1 as well as the t-statistic of the difference between these two estimates. In Panel A, the dependent variable is the change in capital expenditure one year after the bond is issued relative to the year before the issue. In Panel B, I look at the change two years after. The results show that capital spending response to covenants restricting investment activities is driven by firms that are financially constrained. If the firm is younger, has low cash on hand, or low dividend payout ratio, then issuing bonds with investment restrictions lead to a significant decrease in capital expenditure in the following years, relative to a similar firm who issue the bond without the covenant. These results may suggest that covenant restricting risky investment in bond indenture might be effective at addressing the overinvestment problem since firms that are closer to financial distress are also more likely to engage in asset substitution.

Table 8 reports the result of the analysis for covenant restricting financing activities. While all groups of firms see a significant impact on investment from the inclusion of the covenant, firm that are classified as less constrained exhibit a higher sensitivity. Across all measured of financial health, firms that classify as unconstrained see a very significant increase in investment after issuing bonds with financing restrictions relative to those firms that issue the bonds without the covenants. This may suggest that financially unconstrained firms that issue bonds with financing restrictions do so in order to reduce the cost of debt, which enables them to undertake more investment opportunities. However, firms that are classified as financially constrained also see a significant increase in investment following the issuance of a bond with covenant restricting financing activities, relative to similar firms that issue the bond without the covenants. Because agency cost is higher for these firms, including the covenant may also reduce the cost of debt relative to similarly constrained firms and thus enable them to invest more. However, these firms are also more likely to engage in risky asset substitution and overinvestment. Because they are closer to financial distress, higher investment volatility is more valuable since it increases the upside without

changing the downside. This suggests that issuing bonds with only financing restriction may exacerbate the overinvestment problem in financially constrained firms.

6 Conclusion

This paper investigates the ex-post effect of covenants restricting investment and financing activities on investment policy. Using a two-stage estimation method to control for the fact that firms choose to include covenants, I find that the investment response differs between the two groups of covenants. Firms that issue bonds with investment restrictions have lower level of capital expenditure in the following years, relative to similar firms that issue bonds without the restrictions. This effect is concentrated among firms that are more financially constrained. This results suggest that investment restrictions can be effective at mitigating overinvestment in risky assets. On the other hand, firms that issue bonds with financing restrictions have higher level of capital expenditure in the following years, relative to similar firms that issue the bond without the restrictions. The effect is just as strong in firms that are financially constrained and those that are not. These results may imply that issuing bonds only with financing restrictions enables firms to lower the cost of debt and invest more, but may exacerbate overinvestment behavior in firms that are closer to financial distress.

References

Almeida, Heitor, and Murillo Campello, 2007, Financial Constraints, Asset Tangibility, and Corporate Investment, *Review of Financial Studies* 20, 1429–1460.

Almeida, Heitor, Murillo Campello, and Dirk Hackbarth, 2011, Liquidity Mergers, *Journal of Financial Economics* 102, 526–558.

Alti, Aydogan, 2003, How Sensitive Is Investment to Cash Flow When Financing Is Frictionless?, *Journal of Finance* 58, 707–722.

Asquith, Paul, and Thierry A. Wizman, 1990, Event Risk, Covenants, and Bondholder Returns in Leveraged Buyouts, *Journal of Financial Economics* 27, 195–213.

Baker, Malcolm, Jeremy C. Stein, and Jeffrey Wurgler, 2003, When Does the Market Matter? Stock Prices and the Investment of Equity-Dependent Firms, *The Quarterly Journal of Economics* 118, 969–1005.

Bakke, Tor-erik, and Toni M. Whited, 2010, Which Firms Follow the Market? An Analysis of Corporate Investment Decisions, *Review of Economic Studies* 23, 1941–1980.

Begley, Joy, 1994, Restrictive Covenants Included in Public Debt Agreements: An Empirical Investigation by, *Working Paper* .

Berkovitch, Elazar, and E. Han Kim, 1990, Financial Contracting and Leverage Induced Over- and Under-Investment Incentives, *Journal of Finance* 45, 765–794.

Billett, Matthew T., Tao-hsien Dolly King, and David C. Mauer, 2007, Growth Opportunities and the Choice of Leverage , Debt Maturity , and Covenants, *Journal of Finance* 62, 697–730.

Bradley, Michael, and Michael R. Roberts, 2015, The Structure and Pricing of Corporate Debt Covenants, *Quarterly Journal of Finance* 05, 1550001.

Brennan, Michael J., and Eduardo S. Schwartz, 1984, Optimal Financial Policy and Firm Valuation, *Journal of Finance* 39, 593–607.

Chava, Sudheer, Praveen Kumar, and Arthur Warga, 2010, Managerial Agency and Bond Covenants, *Review of Financial Studies* 23, 1120–1148.

Chava, Sudheer, and Michael R. Roberts, 2008, How Does Financing Impact Investment? The Role of Debt Covenants, *Journal of Finance* 63, 2085–2121.

Cook, Douglas O., and John C. Easterwood, 1994, Poison Put Bonds: An Analysis of Their Economic Role, *Journal of Finance* 49, 1905–1920.

Demiroglu, Cem, and Christopher M. James, 2010, The Information Content of Bank Loan Covenants, *Review of Financial Studies* 23, 3700–3737.

Denis, David J., and Valeriy Sibilkov, 2010, Financial Constraints, Investment, and the Value of Cash Holdings, *Review of Financial Studies* 23, 247–269.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen, 1988, Financing Corporate Constraints Investment, *Brookings Papers on Economic Activity* 1, 141–206.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce C. Petersen, 2000, Investment-Cash Flow Sensitivities are Useful: a Comment on Kaplan and Zingales, *Quarterly Journal of Economics* 115, 695–705.

Goyal, Vidhan K., 2005, Market Discipline of Bank Risk: Evidence from Subordinated Debt Contracts, *Journal of Financial Intermediation* 14, 318–350.

Hennessy, Christopher A., 2004, Tobin ' s Q, Debt Overhang, and Investment, *Journal of Finance* 59, 1717–1742.

Hovakimian, Gayané, and Sheridan Titman, 2006, Corporate Investment with Financial Constraints : Sensitivity of Investment to Funds from Voluntary Asset Sales, *Journal of Money, Credit and Banking* 38, 357–374.

Jensen, Michael C., and William H. Meckling, 1976, Theory of the Firm : Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3, 305–360.

Kahan, Marcel, and David Yermack, 1998, Investment Opportunities and the Design of Debt Securities, *Journal of Law, Economics, and Organization* 14, 136–151.

Kalay, Avner, 1982, Stockholder-Bondholder Conflict and Dividend Constraints, *Journal of Financial Economics* 10, 211–233.

Kaplan, Steven N., and Luigi Zingales, 1997, Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints ?, *Quarterly Journal of Economics* 112, 169–215.

Lang, Larry, Eli Ofek, and René M. Stulz, 1996, Leverage, Investment, and Firm Growth, *Journal of Financial Economics* 40, 3–29.

Malitz, Ileen, 1986, On Financial Contracting: of Bond The Determinants, *Financial Management* 15, 18–25.

Mauer, David C., and Steven H. Ott, 2000, Agency Costs, Underinvestment, and Optimal Capital Structure, *Project flexibility, agency, and competition: New developments in the theory and application of real options. Oxford* 151–179.

Myers, Stewart C., 1977, Determinants of Corporate Borrowing, *Journal of Financial Economics* 5, 147–175.

Nash, Robert C., Jeffry M. Netter, and Annette B. Poulsen, 2003, Determinants of Contractual Relations between Shareholders and Bondholders: Investment Opportunities and Restrictive Covenants, *Journal of Corporate Finance* 9, 201–232.

Nini, Greg, David C. Smith, and Amir Sufi, 2009, Creditor Control Rights and Firm Investment Policy, *Journal of Financial Economics* 92, 400–420.

Reisel, Natalia, 2014, On the Value of Restrictive Covenants: Empirical Investigation of Public Bond Issues, *Journal of Corporate Finance* 27, 251–268.

Smith, Clifford W., and L. MacDonald Wakeman, 1985, Determinants of Corporate Leasing Policy, *Journal of Finance* 40, 895–908.

Smith, Clifford W., and Jerold B. Warner, 1979, On Financial Contracting, *Journal of Financial Economics* 7, 117–161.

Spyridopoulos, Ioannis, 2018, Tough Love: The Causal Effects of Debt Covenants on Firm Performance, *Working Paper* .

Stulz, René M., and Herb Johnson, 1985, An Analysis of Secured Debt, *Journal of Financial Economics* 14, 501–521.

Verde, Mariarosa, 1999, Loan Preserver: The Value of Covenants, *FitchIBCA Loan Products Special Report* .

Whited, Toni M., 1992, Debit, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data, *Journal of Finance* 47, 1425–1460.

Whited, Toni M., 2006, External Finance Constraints and the Intertemporal Pattern of Intermittent Investment, *Journal of Financial Economics* 81, 467–502.

Wooldridge, Jeffrey M., 2002, *Econometric Analysis of Cross Section and Panel Data*, volume 58 (MIT Press).

Ziliak, James P., and Thomas J. Kniesner, 1998, The Importance of Sample Attrition in Life Cycle Labor Supply Estimation, *Journal of Human Resources* 33, 507–530.

Appendix A: Classification of bond covenants

Bond Covenant in FISD	Description in FISD
Investment Restrictions	
AFTER_ACQUIRED_PROPERTY_CLAUSE	Property acquired after the sale of current debt issues will be included in the current issuer's mortgage.
TRANSACTION_AFFILIATES	Issuer is restricted in certain business dealings with its subsidiaries.
SUBSIDIARY_REDESIGNATION	Indicates if restricted subsidiaries may be reclassified as an unrestricted subsidiaries.
ASSET_SALE_CLAUSE	Covenant requiring the issuer to use net proceeds from the sale of certain assets to redeem the bonds at par or at a premium.
SALE_XFER_ASSETS_UNRESTRICTED	Issuer must use proceeds from sale of subsidiaries' assets to reduce debt.
SECURITY_LEVEL = SS	Indicates if the security is a secured issue of the issuer.
STOCK_TRANSFER_SALE_DISP	Restricts the issuer from transferring, selling, or disposing of it's own common stock or the common stock of a subsidiary.
INVESTMENTS	Restricts issuer's investment policy to prevent risky investments.
INVESTMENTS_UNRESTRICTED_SUBS	Restricts subsidiaries' investments.
Financing Restrictions	
FUNDED_DEBT_IS	Restricts issuer from issuing additional funded debt.
INDEBTEDNESS_IS	Restricts user from incurring additional debt with limits on absolute dollar amount of debt outstanding or percentage total capital.
FUNDED_DEBT_SUB	Restricts issuer's subsidiaries from issuing additional funded debt.
INDEBTEDNESS_SUB	Restricts the total indebtedness of the subsidiaries.
SENIOR_DEBT_ISSUANCE	Restricts issuer to the amount of senior debt it may issue in the future.
SUBORDINATED_DEBT_ISSUANCE	Restricts issuance of junior or subordinated debt.
NET_EARNINGS_TEST_ISSUANCE	To issue additional debt the issuer must have achieved or maintained certain profitability levels.
LEVERAGE_TEST_IS	Restricts total-indebtedness of the issuer.
LEVERAGE_TEST_SUB	Limits subsidiaries' leverage.
BORROWING_RESTRICTED	Indicates subsidiaries are restricted from borrowing, except from parent.
NEGATIVE_PLEDGE_COVENANT	The issuer cannot issue secured debt unless it secures the current issue on a pari passu basis.
SALES_LEASEBACK_IS	Restricts issuer to the type or amount of property used in a sale leaseback transaction and may restrict its use of the proceeds of the sale.
SALES_LEASEBACK_SUB	Restricts subsidiaries from selling then leasing back assets that provide security for the debtholder.

Appendix B: Variable Definitions

CAPEX: Capital expenditure divided by start of period assets (lagged assets).

CashFlow: Sum of Income Before Extraordinary Items and Depreciation and Amortization divided by start of period assets.

Q (Market to book): Book value of assets minus book value of equity plus market value of equity divided by book value of assets. Book value of equity is stockholders equity minus preferred stock redemption value plus deferred taxes and investment tax credit.

Size: Natural logarithm of total assets.

Leverage: Sum of debt in current liabilities and long-term debt divided by assets.

Cash: Cash and cash equivalents divided by assets.

PPE/Assets: Ratio of net property, plant and equipment to total assets.

EBITDA/Assets:Ratio of earnings before interest to total assets.

Cash Flow Volatility: Standard deviation of the ratio of EBITDA/Assets and is computed using historical data for up to 10 years as available.

Dividends: A dummy variable that indicates whether the firm declared any dividends to its common shareholders.

Dividend Payout Ratio: Ratio of Dividends declared to common shareholders to Income Before Extraordinary Items.

AGE: Number of years in Compustat.

KZ_Index: Sum of (-1.002) times CashFlow, (-39.368) times total dividend divided by assets, (-1.315) times Cash, 3.139 times Leverage, and 0.283 times Q.

Investment Grade: A dummy variable that equals 1 if the company S&P long-term credit rating is 'BBB-" or better, and equals 0 if the rating is worse than 'BBB-" or the company is unrated.

Offering yield is the yield-to-maturity at the time of issuance.

Loan amount/Assets is the ratio of the bond offering amount to total assets.

Maturity is the number of years between the offering date and the maturity date.

Putable, Callable, Convertible are dummies equal to one if the feature is present in the bond.

Credit Spread is the difference in the yields on BAA and AAA corporate bonds.

Term Spread is the difference between the 10-year and 1-year treasury bonds.

Table 1: Summary statistics

This table presents descriptive statistics for variables in the sample. The bond data come from the 2016 FISD. The sample is restricted to bonds issued by U.S. domiciled non-financial companies that are in U.S. dollars at the intersection of FISD, CRSP and Compustat during 1989-2015. I exclude Yankee, Canadian, foreign currency, government bonds, medium term notes, private placements, bonds with rule 144a, and bonds with missing covenant information, subsequent data, offering yield, offering date, maturity date, or security level. Loan characteristics and credit ratings are at the time the bond are issued and firms characteristics correspond to the beginning of the fiscal year in which the bonds are issued. The column *All* represent the whole sample. *T-DIF* is the t-value of the difference in the mean values of firms that issued bonds with the covenant (Yes) and those that did not include the covenant (No). Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B.

	All	Investment Restrictions			Financing Restrictions		
		Yes	No	T-DIF	Yes	No	T-DIF
Loan characteristics							
Offering yield	5.52	8.41	5.12	30.69	5.73	4.62	12.41
Loan amount/Assets	0.09	0.23	0.08	12.47	0.08	0.16	-9.03
Maturity (years)	13.11	11.07	13.39	-7.33	12.91	13.96	-2.83
Putable	0.05	0.01	0.06	-8.60	0.01	0.23	-14.27
Callable	0.96	0.96	0.96	-0.65	0.98	0.88	8.39
Convertible	0.09	0.02	0.10	-8.43	0.01	0.42	-22.98
Firm characteristics							
CAPEX	0.08	0.12	0.07	7.08	0.08	0.10	-4.81
Assets (millions)	24,826	4,264	27,728	-29.40	21,203	40,513	-7.62
Q	1.75	1.40	1.80	-12.37	1.72	1.90	-4.09
Cash Flow	0.11	0.08	0.11	-7.44	0.11	0.09	4.81
Leverage	0.30	0.39	0.29	13.21	0.31	0.27	5.90
PPE/Assets	0.38	0.47	0.37	7.86	0.38	0.39	-1.90
EBITDA/Assets	0.14	0.11	0.15	-9.81	0.15	0.12	8.78
Cashflow Volatility	0.04	0.05	0.04	4.65	0.04	0.05	-7.66
Cash/Assets	0.09	0.07	0.09	-3.39	0.08	0.13	-9.59
Dividends	0.74	0.42	0.79	-16.47	0.77	0.62	8.04
Dividends Payout Ratio	0.32	0.13	0.35	-10.37	0.32	0.33	-0.68
AGE	33.69	21.31	35.44	-16.86	34.57	29.89	6.30
KZ_Index	0.55	1.19	0.43	17.42	0.52	0.70	-3.56
Investment Grade	0.74	0.17	0.82	-37.02	0.78	0.57	11.07
Macroeconomics factors							
Credit Spread	1.04	0.92	1.06	-6.60	1.05	1.00	3.04
Term Spread	1.75	1.65	1.77	-2.34	1.74	1.80	-1.45
Observations	4221	522	3699		3429	792	
Percentage	100	12.4	87.6		81.2	18.8	

Table 2: Covenant selection reduced form probit

This table presents the results of the probit regression of covenant inclusion from equation (1). The bond data come from the 2016 FISD. The sample is restricted to bonds issued by U.S. domiciled non-financial companies that are in U.S. dollars at the intersection of FISD, CRSP and Compustat during 1989-2015. I exclude Yankee, Canadian, foreign currency, government bonds, medium term notes, private placements, bonds with rule 144a, and bonds with missing covenant information, subsequent data, offering yield, offering date, maturity date, or security level. Loan characteristics and credit ratings are at the time the bond are issued and firms characteristics correspond to the beginning of the fiscal year in which the bonds are issued. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. Standard errors are adjusted for clustering at the firm level. t-stats are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% respectively.

	Investment Restrictions		Financing Restrictions	
	Estimate	t-stat	Estimate	t-stat
Log(Assets)	-0.41^{***}	(-7.06)	-0.23^{***}	(-3.46)
Log(Market to Book)	-0.82^{***}	(-5.09)	-0.22	(-1.38)
Leverage	0.65^{*}	(1.84)	1.68^{***}	(3.24)
PPE/Assets	0.58^{**}	(2.33)	-0.80^{**}	(-2.53)
EBITDA/Assets	-0.50	(-0.70)	1.92^{**}	(2.08)
Cashflow Volatility	-2.38	(-1.52)	-2.27	(-1.41)
Firm Rating				
A	-0.52^{***}	(-2.73)	0.39^{*}	(1.92)
BBB	-1.14^{***}	(-6.14)	0.87^{***}	(4.37)
BB	0.62^{***}	(3.62)	0.55^{**}	(2.53)
B	0.83^{***}	(3.57)	0.37	(1.54)
Log(Maturity)	0.08	(0.99)	0.05	(1.00)
Loan amount/Assets	1.12^{***}	(3.09)	-0.29	(-0.71)
Putable	-0.62^{*}	(-1.69)	-0.75^{***}	(-3.35)
Callable	0.19	(0.62)	1.04^{***}	(4.95)
Convertible	-2.02^{***}	(-9.53)	-2.54^{***}	(-12.87)
Credit Spread	0.06	(0.49)	0.04	(0.47)
Term Spread	0.02	(0.57)	-0.13^{***}	(-3.73)
Intercept	2.34^{***}	(3.44)	2.76^{***}	(3.59)
One digit sic code	Yes		Yes	
R^2	0.51		0.41	
N	4221		4221	
$covenant = yes$	522		3429	

Table 3: Investment restrictions

This table reports the results from the regression in equation (2) for covenant restricting investment activities. The dependent variable is the change in capital expenditure scaled by lagged assets. *Investment restrictions* is a dummy that equals one if the restriction is present in the bond contract. All control variables are lagged one year except for cash flow which is contemporaneous. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. Standard errors are adjusted for clustering at the firm level. t-stat are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: $\Delta CAPEX = CAPEX_{+1} - CAPEX_{-1}$

	(1)		(2)		(3)		(4)		(5)	
Investment restr.	-0.01^{*}	(-1.89)	-0.02^{**}	(-2.30)	-0.01^{*}	(-1.79)	-0.02^{**}	(-2.41)	-0.01^{*}	(-1.89)
Mills Ratio	0.01^{*}	(1.86)	0.01^{**}	(1.99)	0.01^{*}	(1.69)	0.01^{**}	(2.14)	0.01^{*}	(1.83)
$\Delta CashFlow$			0.22^{***}	(7.01)	0.14^{***}	(4.79)	0.23^{***}	(7.41)	0.15^{***}	(5.27)
ΔQ			0.02^{***}	(3.52)	0.01^{**}	(2.44)	0.01^{***}	(2.85)	0.01^{**}	(2.05)
$\Delta Size$					-0.09^{***}	(-7.60)			-0.08^{***}	(-7.32)
$\Delta Leverage$							-0.15^{***}	(-4.75)	-0.09^{***}	(-3.27)
Year F.E.	Yes		Yes		Yes		Yes		Yes	
R^2	0.07		0.16		0.24		0.19		0.25	
N	3730		3703		3703		3703		3703	

Panel B: $\Delta CAPEX = CAPEX_{+2} - CAPEX_{-1}$

	(1)		(2)		(3)		(4)		(5)	
Investment restr.	-0.02^{*}	(-1.84)	-0.02^{**}	(-2.31)	-0.02^{*}	(-1.92)	-0.02^{**}	(-2.42)	-0.02^{**}	(-2.02)
Mills Ratio	0.01^{*}	(1.69)	0.01^{**}	(1.97)	0.01^{*}	(1.78)	0.01^{**}	(2.07)	0.01^{*}	(1.87)
$\Delta CashFlow$			0.24^{***}	(6.77)	0.16^{***}	(4.67)	0.25^{***}	(7.15)	0.17^{***}	(5.00)
ΔQ			0.02^{***}	(4.13)	0.01^{**}	(2.41)	0.02^{***}	(3.58)	0.01^{**}	(2.14)
$\Delta Size$					-0.10^{***}	(-7.25)			-0.09^{***}	(-6.85)
$\Delta Leverage$							-0.15^{***}	(-4.92)	-0.09^{***}	(-3.12)
Year F.E.	Yes		Yes		Yes		Yes		Yes	
R^2	0.08		0.19		0.27		0.21		0.28	
N	3301		3278		3278		3278		3278	

Table 4: Financing restrictions

This table reports the results from the regression in equation (2) for covenant restricting financing activities. The dependent variable is the change in capital expenditure scaled by lagged assets. *Financing restrictions* is a dummy that equals one if the restriction is present in the bond contract. All control variables are lagged one year except for cash flow which is contemporaneous. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. Standard errors are adjusted for clustering at the firm level. t-stat are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: $\Delta CAPEX = CAPEX_{+1} - CAPEX_{-1}$

	(1)	(2)	(3)	(4)	(5)
Financing restr.	0.04^{***} (4.00)	0.03^{***} (4.01)	0.02^{***} (3.06)	0.03^{***} (3.93)	0.02^{***} (3.06)
Mills Ratio	-0.01^{***} (-4.00)	-0.01^{***} (-3.99)	-0.01^{***} (-3.13)	-0.01^{***} (-3.94)	-0.01^{***} (-3.13)
$\Delta CashFlow$		0.21^{***} (6.85)	0.14^{***} (4.71)	0.22^{***} (7.25)	0.15^{***} (5.18)
ΔQ		0.02^{***} (3.71)	0.01^{***} (2.58)	0.01^{***} (3.04)	0.01^{**} (2.19)
$\Delta Size$			-0.09^{***} (-7.58)		-0.08^{***} (-7.28)
$\Delta Leverage$				-0.15^{***} (-4.66)	-0.09^{***} (-3.19)
Year F.E.	Yes	Yes	Yes	Yes	Yes
R^2	0.08	0.17	0.24	0.19	0.25
N	3730	3703	3703	3703	3703

Panel B: $\Delta CAPEX = CAPEX_{+2} - CAPEX_{-1}$

	(1)		(2)		(3)		(4)		(5)	
Financing restr.	0.05^{***}	(4.53)	0.05^{***}	(4.80)	0.04^{***}	(4.02)	0.05^{***}	(4.73)	0.04^{***}	(4.01)
Mills Ratio	-0.02^{***}	(-4.56)	-0.02^{***}	(-4.68)	-0.01^{***}	(-4.04)	-0.02^{***}	(-4.61)	-0.01^{***}	(-4.02)
$\Delta CashFlow$			0.24^{***}	(6.76)	0.16^{***}	(4.65)	0.24^{***}	(7.13)	0.17^{***}	(4.97)
ΔQ			0.02^{***}	(4.43)	0.01^{***}	(2.64)	0.02^{***}	(3.88)	0.01^{**}	(2.37)
$\Delta Size$					-0.10^{***}	(-7.08)			-0.09^{***}	(-6.65)
$\Delta Leverage$							-0.15^{***}	(-4.75)	-0.09^{***}	(-2.99)
Year F.E.	Yes		Yes		Yes		Yes		Yes	
R^2	0.08		0.19		0.27		0.21		0.28	
N	3301		3278		3278		3278		3278	

Table 5: Counterfactual regression investment restrictions

This table reports the mean of predicted change in capital expenditure using equation

$$\Delta CAPEX = \alpha_0\, IMR + \beta_1\, \Delta Cashfow + \beta_2\, \Delta Q + \beta_3\, \Delta Size + \beta_4\, \Delta Leverage + \varepsilon_i$$

The dependent variable is the change in capital expenditure scaled by lagged assets. The regression is estimated separately for firms with and without *Investment restrictions*. Two sets of predicted change in capital expenditure is then computed, excluding the inverse Mills ratio, for the entire sample using the estimates from both regressions, one set with the covenant restrictions) and a corresponding set without it. All control variables are lagged one year except for cash flow which is contemporaneous. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. Standard errors are adjusted for clustering at the firm level. t-stat are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

	$\Delta CAPEX = CAPEX_{+1} - CAPEX_{-1}$		$\Delta CAPEX = CAPEX_{+2} - CAPEX_{-1}$	
	(1)	(2)	(3)	(4)
Investment restrictions	Yes	No	Yes	No
Average Predicted $\Delta CAPEX * 100$	-1.68	-0.48	-2.93	-0.78
Std. err	(0.09)	(0.05)	(0.10)	(0.06)
Difference in predicted means	-1.20***		-2.15***	
st. err	(0.10)		(0.11)	
t-value	-12.27		-19.36	
Regressions results				
R^2	0.35	0.26	0.38	0.30
Observations	411	3292	371	2907

Table 6: Counterfactual regression financing restrictions

This table reports the mean of predicted change in capital expenditure using equation

$$\Delta CAPEX = \alpha_0\, IMR + \beta_1\, \Delta Cashfow + \beta_2\, \Delta Q + \beta_3\, \Delta Size + \beta_4\, \Delta Leverage + \varepsilon_i$$

The dependent variable is the change in capital expenditure scaled by lagged assets. The regression is estimated separately for firms with and without *Financing restrictions*. Two sets of predicted change in capital expenditure is then computed, excluding the inverse Mills ratio, for the entire sample using the estimates from both regressions, one set with the covenant restrictions) and a corresponding set without it. All control variables are lagged one year except for cash flow which is contemporaneous. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. Standard errors are adjusted for clustering at the firm level. t-stat are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

	$\Delta CAPEX = CAPEX_{+1} - CAPEX_{-1}$		$\Delta CAPEX = CAPEX_{+2} - CAPEX_{-1}$	
	(1)	(2)	(3)	(4)
Financing restrictions	Yes	No	Yes	No
Average predicted $\Delta CAPEX * 100$	-1.06	-3.33	-1.35	-4.92
Std. err	(0.05)	(0.06)	(0.05)	(0.08)
Difference in predicted means	2.27***		3.56***	
st. err	(0.08)		(0.10)	
t-value	29.83		37.04	
Regressions results				
R^2	0.24	0.36	0.25	0.44
Observations	3001	702	2669	609

Table 7: Investment restrictions and financial constraints

This table reports the estimated coefficients and t-statistics of β_0 and β_1 as well as the t-statistic of the difference between these two estimates from the regression in equation (3) for covenant restricting investment activities. The dependent variable is the change in capital expenditure scaled by lagged assets. All control variables are lagged one year except for cash flow which is contemporaneous. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. The regressions specification interacts an indicator variable corresponding to different proxies for financial constraints with every right-hand side variable. The indicator proxies are all measured at the end of the fiscal year prior to the bond issuance and include. A firm is classified as Younger (Older), Low (High), or Small (Large) if it is in the lower (upper) third of the distribution for AGE, CASH, or KZ INDEX, and is considered financially constrained (unconstrained). A firm is classified as Low for DPR and considered financially constrained if it declared less than 10% of income in dividend, and as High and considered financially unconstrained if it declared more than 30% or dpr has a negative value. Standard errors are adjusted for clustering at the firm level. t-stat are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: $\Delta CAPEX = CAPEX_{+1} - CAPEX_{-1}$

AGE		CASH		DPR		KZ INDEX	
Younger	-0.021**	Low	-0.025**	Low	-0.015*	Large	-0.014
	(-2.14)		(-2.57)		(-1.91)		(-1.63)
Older	0.002	High	-0.002	High	-0.004	Small	-0.006
	(0.26)		(-0.16)		(-0.60)		(-0.56)
T-Dif	2.55	T-Dif	1.80	T-Dif	1.40	T-Dif	0.73
Obs.	2632	Obs.	2444	Obs.	3335	Obs.	1493

Panel B: $\Delta CAPEX = CAPEX_{+2} - CAPEX_{-1}$

AGE		CASH		DPR		KZ INDEX	
Younger	-0.030**	Low	-0.026**	Low	-0.025***	Large	-0.021**
	(-2.53)		(-2.27)		(-2.60)		(-2.01)
Older	0.004	High	-0.0181	High	0.000	Small	0.007
	(0.39)		(-1.26)		(-0.02)		(0.55)
T-Dif	3.02	T-Dif	0.51	T-Dif	2.68	T-Dif	2.41
Obs.	2332	Obs.	2149	Obs.	2961	Obs.	1335

Table 8: Financing restrictions and financial constraints

This table reports the estimated coefficients and t-statistics of β_0 and β_1 as well as the t-statistic of the difference between these two estimates from the regression in equation (3) for covenant restricting financing activities. The dependent variable is the change in capital expenditure scaled by lagged assets. All control variables are lagged one year except for cash flow which is contemporaneous. Covenant restrictions are described in Appendix A and variable definitions appear in Appendix B. The regressions specification interacts an indicator variable corresponding to different proxies for financial constraints with every right-hand side variable. The indicator proxies are all measured at the end of the fiscal year prior to the bond issuance and include. A firm is classified as Younger (Older), Low (High), or Small (Large) if it is in the lower (upper) third of the distribution for AGE, CASH, or KZ INDEX, and is considered financially constrained (unconstrained). A firm is classified as Low for DPR and considered financially constrained if it declared less than 10% of income in dividend, and as High and considered financially unconstrained if it declared more than 30% or dpr has a negative value. Standard errors are adjusted for clustering at the firm level. t-stat are provided in parentheses. ***, **, * indicates statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: $\Delta CAPEX = CAPEX_{+1} - CAPEX_{-1}$

AGE		CASH		DPR		KZ INDEX	
Younger	0.028**	Low	0.034***	Low	0.028***	Large	0.022*
	(2.29)		(3.21)		(3.06)		(1.85)
Older	0.041***	High	0.045***	High	0.034***	Small	0.033***
	(3.48)		(4.14)		(3.72)		(2.76)
T-Dif	3.17	T-Dif	2.59	T-Dif	1.94	T-Dif	3.65
Obs.	2632	Obs.	2444	Obs.	3335	Obs.	1493

Panel B: $\Delta CAPEX = CAPEX_{+2} - CAPEX_{-1}$

AGE		CASH		DPR		KZ INDEX	
Younger	0.043***	Low	0.051***	Low	0.042***	Large	0.024*
	(3.41)		(4.36)		(3.42)		(1.91)
Older	0.056***	High	0.053***	High	0.051***	Small	0.041***
	(4.50)		(4.43)		(4.25)		(3.45)
T-Dif	3.31	T-Dif	0.49	T-Dif	2.40	T-Dif	4.32
Obs.	2332	Obs.	2149	Obs.	2961	Obs.	1335