The Role of Corporate Governance in the Debtholder-Equityholder Conundrum : Evidence from Bank Loan Contracting

Master Thesis in Financial Economics

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Preface

This thesis is the final work of my Master Program in Financial Economics at Erasmus School of Economics. First of all, I would like to thank my supervisor, professor Tim Eisert. His support and constructive guidance helped me conduct my work in a timely manner. Additionally, I want to thank beforehand the second reader, Alexandar Andonov for devoting his time to evaluate this thesis. I would also like to express my gratitude to professor and researcher Tobias Berg for welcoming my interest in his work and permitting me to make use of his dataset. I am grateful to my managers at work, professor Kristina Dorvojeda and Mark Lengton for their support and for being truly interested in my work. Lastly, I want to thank my family and friends, in particular R.Shala, D.Ender, B.Henneman, A.Golovchenko and E.Unal for the continuous moral support.

Abstract

This dissertation examines the effect of borrowers' corporate governance on the price and non-price terms of loans. Using a novel measure for the pricing of loans, the empirical evidence advocates a non-linear relationship between institutional ownership and the total cost of borrowing. Furthermore, insider ownership concentration tends to increase the price of loans as it raises banks' concerns of risk-shifting. This relationship however, is moderated if the firm has weak shareholder rights as proxied by the existence of anti-takeover provisions. Evidence also indicates that firms with larger corporate boards obtain more favourable pricing terms. The main results demonstrate that banks acknowledge the importance of governance and adjust the lending terms accordingly. More specifically, the findings show that lenders and equityholders do not necessarily perceive optimal governance the same way.

Keywords: corporate governance, agency cost of equity, agency cost of debt, bank loan contracting

Contents

1 Introduction

The capacity of firms to attract capital is of fundamental importance for their continuous expansion of economic activities in situations where internal financing options are exhausted. In such scenarios, opting for external financing comes at a price that is usually higher than the required return on the capital provided due to agency costs. The academic literature recognizes two main agency costs originating from external financing: the agency cost of equity as a result of manager-shareholder misalignment of interests leading to higher private benefits of control and the agency cost of debt potentially resulting in risk-shifting due to shareholders' preference for high-risk projects at the expense of debtholders (Jensen and Meckling (1976); Jensen (1993); Shleifer and Vishny (1997)). Interestingly, extensive theoretical and empirical research argues that firms' optimal capital structure and cost of capital therefore depends, among other things, on the corporate governance of firms (see Bolton and Scharfstein (1996); Rajan and Winton (1995)).

This dissertation explores in depth the effect of corporate governance mechanisms on the total cost of borrowing in the loan market. While there has been substantial research dedicated to the effect of corporate governance on firm value, stock returns and bond yields (Gompers et al. (2003); Ashbaugh-Skaife et al. (2006); Klock et al. (2005); Cremers et al. (2007)), little is known on the impact of governance on bank loans as a private source of finance. Bradley and Roberts (2003) argue that since 1994, private debt in the USA has been between two to threefold larger than the amount of publicly issued debt. To gauge the economic importance of the loan market, Cerutti et al. (2015) report that the syndicated loan volume reached $3.5 trillion globally, an increase of 160% from 1995 to 2012.

Given the importance of private financing and its potential repercussions on the firms' cost of capital, it is imperative to understand the factors that drive the contracting terms of bank loans. While some studies focus on the impact of the overall quality of corporate governance on the pricing of loans, most of them deal with one or just a few aspects of corporate governance, focusing mainly on the board of directors and anti-takeover provisions (see e.g. Chava et al. (2009); Francis et al. (2009)). However, as illustrated by Agrawal and Knoeber (1996), the modern corporation today is a complex organisation

with various corporate governance mechanisms which usually interact with each other. Hence, it is crucial to explore these aspects of governance simultaneously rather than treating them independently as it might lead to biased conclusions. Considering the gap in the literature, I build on a framework developed by Standard & Poor's [1] and focus on three measures of corporate governance, namely ownership structure, board structure and shareholder financial rights as proxied by the presence of anti-takeover provisions. The three mechanisms aim at reducing agency problems, alleviating information asymmetry between insiders and outsiders and thus diminishing moral hazard. As information risk and credit risk of firms are two main elements of bank loan contracting, I expect lenders to consider these mechanisms of governance when drafting loan terms.

Traditionally, best practices of corporate governance rely on mechanisms that effectively align the interests of managers and shareholders. Nevertheless, it is worth pointing out that quality corporate governance as perceived from the eyes of equity holders might differ from the creditors' standpoint. For instance, it is often suggested that without efficient monitoring, managers might engage in activities that expropriate firm's resources for private benefits instead of responding to shareholders' interests. While such behaviour can decrease shareholder wealth, it does not necessarily have the same impact on creditors. Research argues that managers prefer a "quiet life" by engaging in low-risk projects as their human capital is directly tied to the firm (see e.g. John et al. (2008); Kempf et al. (2009); Pathan (2009)). Such actions of management are beneficial for creditors due to the concave payoff structure of debt. Therefore, instead of labelling governance mechanisms as good or bad, I argue that their ultimate effect depends on the parties at stake. To the extent that creditors regard corporate governance as detrimental to their interest, they will lend at less favourable terms.

Using a panel data on 3,965 loans granted to 1,023 US firms from 1998 until 2012, I test the effect of institutional ownership, insider ownership, board structure and shareholder rights on the total cost of borrowing by estimating pooled OLS regressions. As opposed to other research on loan contracting that use the all-in-drawn-spread to measure the cost of borrowing, I employ a novel measure labelled as the total cost of borrowing (hereafter TCB). Berg et al. (2016) introduce this new measure suggesting that it better captures

[1] Standard & Poor's, 2002. Standard & Poor's Corporate Governance Scores: Criteria, Methodology and Definitions. McGraw-Hill Companies, Inc., New York.

the cost of borrowing as it accounts for the spread, loan fees and the likelihood that the loan will be paid. Furthermore, I extend my analysis to nonprice terms of bank loans as they usually represent an additional cost for the borrower.

Results show that there is a non-linear relationship between institutional ownership and the total cost of borrowing. This implies that lenders acknowledge the benefits of institutional ownership in preventing managerial self-serving behaviour up to a certain level of institutional concentration. In particular, the relation exhibits a seemingly U-shaped pattern; the total cost of borrowing decreases with institutional ownership when the latter is below 65% and increases with institutional ownership when the institutions own more than 65% of the firm. This finding suggests that banks are concerned about potential risk-shifting whenever the ownership structure is sufficiently concentrated as it can easily exert pressure on management through their voting power.

With regard to insider ownership, the results point at a significantly positive effect of insider ownership on the borrowing costs. Controlling for other factors, one standard deviation increase in insider ownership results in 3.9 basis points increase in the total cost of borrowing, or alternatively a 0.95% increase from its mean. The influence of board attributes varies with the different model specifications. However, board size remains statistically significant at the 10% level indicating that an additional member on board reduces the total cost of borrowing. The results are in line with Anderson et al. (2004) and Francis et al. (2012) who find an inverse relationship between the cost of debt and the size of corporate boards.

I next turn my attention on how capital structure affects the relationship between the internal governance mechanisms and the total cost of borrowing. Theory suggests that highly leveraged firms have more incentives to engage in risk-shifting activities(**?**). In line with theory, I find a noteworthy increase in the magnitude of the effect of insider ownership on borrowing costs for highly indebted firms. Additionally, I find a significant positive impact of institutional ownership on borrowing costs for low-leverage firms. This suggests that banks are concerned about institutional ownership concentration even for firms with low risk shifting potential.

Lastly, I consider how the degree of shareholder rights impacts the cost of borrowing. As the agency cost of debt arises from the conflict of interest between shareholders and debtholders, weaker shareholder rights could potentially moderate the relationship between internal governance mechanisms under investigation and the total cost of borrowing as argued by Klock et al. (2005) and **?**. I use the Entrenchment Index (hereafter EI) constructed by Bebchuk et al. (2008) to proxy for shareholder rights. While the EI does not significantly moderate the relation between institutional ownership and the cost of borrowing, the effect of insider ownership on the total cost of borrowing is weaker for high levels of entrenchment. The result suggests that once insiders' power increases sufficiently and the probability of a takeover decreases, the impact of insider ownership concentration on the borrowing costs is not that relevant.

In the second part of this thesis, I employ logit regressions to investigate the marginal effect of governance on nonprice terms of loans. More specifically, I inspect the likelihood of loans having financial covenants, prepayment covenants and collateral, conditional on given internal governance measures. As Cai et al. (2012) point out, nonprice terms could serve as screening devices to reduce potential losses associated with borrowers' risks. Accordingly, I find that an increase in board size reduces the likelihood of a loan being secured or having a prepayment covenant. This finding is consistent with the arguments posed by Yermack (1996) that a larger board is less effective in monitoring managers and less able to serve shareholders' interest, thus reducing the risk of asset substitution. Additionally, institutional ownership has a positive marginal effect on the probability of banks imposing prepayment and financial covenants in loan contracts.

To address the concern of simultaneous determination of price and non-price terms as noted by Dennis et al. (2000) and Bradley and Roberts (2003), I run simultaneous-equation regressions based on the methodology of Nelson and Olson (1978). The results show that there is some interdependency among loan terms. Namely, firms with a higher number of restrictive covenants also pay a higher price for borrowing. Additionally, the existence of collateral is positively related to the total cost of borrowing. The impact of governance on the total cost of borrowing remains robust even after controlling for simultaneity among loan terms.Moreover, as governance variables are lagged one quarter before loan origination, the results are less prone to endogeneity. The reasoning behind

is that governance mechanisms in earlier quarters could not have been influenced by borrowing costs in subsequent quarters.

By and large, this thesis contributes to literature in a few ways. First, it fills a gap in the existing research by considering the multiple features of governance and their influence on the cost of bank loans, rather than focusing on one attribute. Second, it complements emerging research on the factors that influence loan contracting terms (Bhojraj and Sengupta (2003); Klock et al. (2005); Cremers et al. (2007)) While these studies focus mainly on the pricing terms, the multifaceted approach in this dissertation overcomes such limitation by additionally considering nonprice terms. Furthermore, it contributes to the intense, on-going discourse on the divergence of interests between shareholders and debtholders (Klock et al. (2005) ; John et al. (2008); Eisert and Hirsch (2013)). The evidence presented here suggests that corporate governance in the context of enhancing shareholder rights increases the agency cost of debt, resulting in less favourable loan terms. Lastly, contrary to the all-in-drawn-spread, the novel pricing measure better captures the complex nature of loan pricing terms.

The organization of this dissertation is as follows: Section 2 presents the theoretical background which lead to the development of the hypotheses. Section 3 describes the dataset and depicts descriptive statistics. Section 4 provides the empirical setting and presents the empirical findings. Section 5 provides robustness checks, section 6 discusses the findings and section 7 concludes.

2 Theoretical Background and Hypotheses Development

2.1 Agency cost of debt and the role of corporate governance

The notion of the agency problem introduced initially by Berle and Means (1932) and developed further by Jensen and Meckling (1976) has been the spotlight of much empirical research on corporate finance. Separation of ownership and control seems to be the

source of such conflict often resulting in decision making that does not maximize the utility functions of all stakeholders involved. The most debated conflict as viewed through the eyes of equity interests is the one between shareholders and managers. Information asymmetry between insiders and external stakeholders due to the separation of ownership and control gives rise to moral hazard where managers pursue their self-interest rather than focusing on the value maximization of the firm. As most of the literature stream was devoted to the wedge between ownership and control (e.g Jensen (1993); Yermack (1996); Gompers et al. (2003)), the main governance mechanisms respond to equity interests. Ashbaugh-Skaife et al. (2006) refer to such role of governance as the *management disciplining* attribute of governance.

The second agency conflict concerns a distinct body of literature and runs parallel to the classical model of corporate governance, however it is principally unconcerned with the self-interested managerial behaviour. Instead, it presumes that managers act on the best interest of shareholders and its focal point is the conflict between debtholders and equityholders (Asquith and Wizman (1990); Klock et al. (2005). As levered equity is synonymous to a call option on the firm's assets, any transaction that increases the volatility of cash flows benefits shareholders but causes devaluation of debt. In other words, shareholders can profit from an increase in firm's riskiness at the expense of debtholders as first noted by Jensen and Meckling (1976). Therefore, governance attributes which grant shareholders more power to discipline management could prompt wealth transfer between shareholders and debtholders since limited liability makes equity a convex function of the firm value. Ashbaugh-Skaife et al. (2006) cite this role of governance as the *wealth redistribution* attribute of corporate governance.

As such, creditors face a twofold risk, namely that of managerial entrenchment that serves private benefits of managers and the risk of asset substitution due to the alignment of shareholder and managerial interests. Literature that focuses on bank loan contracting argues that among other considerations, banks take into account the corporate governance of firms and how it influences the agency costs of debt when determining the loan terms. First, quality corporate governance can lower the information asymmetry between creditors and firms' insiders by building a solid information disclosure system (Sufi (2007)). Dennis and Mullineaux (2000) argue that banks will refrain from lending if firms do not

disclose sufficient information. Rajan and Winton (1995) stress the negative impact of asymmetric information and agency problems on debt contract terms and the cost of capital. They argue that banks are more likely to lend at higher interest rates and stiffen nonprice loan terms by adding restrictive covenants and demanding collateral whenever a firm has austere information and moral hazard problems. Second, by disciplining management actions and decreasing credit risk, corporate governance can lessen the likelihood of firm default (Bhojraj and Sengupta (2003)). Since firm-level corporate governance is pivotal in the reduction of information and default risk, it plays an important role in the drafting of loan contracting terms.

By its very nature, there is little consensus in the literature as to what comprises optimal governance as its effect is contingent upon the interest at stake. I focus on corporate governance mechanisms that tend to align managers and shareholders' interests by adopting a framework refined by Standard & Poor's. More specifically, I analyse how the ownership structure of a firm, board quality and shareholders' financial rights as the main internal governance mechanisms affect the firms' cost of borrowing.

2.2 Prior Empirical Evidence and Hypotheses Development

Shleifer and Vishny (1997) advocate the presence of blockholders and large institutional shareholders as a mechanism to exert pressure on management in order to avoid self-serving behaviour of managers. Building on the management disciplining hypothesis, the presence of institutional investors could reduce agency problems because they have both the incentives and the voting power to prevent managerial entrenchment. They may additionally discipline managerial behaviour through the threat of exit or shareholder activism, thus benefiting both shareholders and creditors (Gillan and Starks (2007); Edmans (2009); Edmans and Manso (2011)). On the other hand, a concentrated institutional ownership may heighten creditors' worry of asset substitution in line with the wealth redistribution hypothesis. Due to their influential authority, large institutional owners could exercise their power upon management to lock in benefits that are inimical to debtholders and minority shareholders (Shleifer and Vishny (1997); Bhojraj and Sengupta (2003)).

A few studies have explored the relationship between ownership structure and the cost of debt (Roberts and Yuan (2010); Lin et al. (2011); Eisert and Hirsch (2013)). Roberts and Yuan (2010) employ the total fraction of ownership held by all institutional shareholders and the Herfindahl Index using the five largest institutional owners as proxies for institutional shareholdings. Using a sample of 7,800 loans in the USA issued between 1995 and 2004, they find evidence of a "U" shaped relationship between institutional ownership and the cost of bank loans. They conclude that the favourable monitoring effects of institutional owners disappear at high levels of concentration. Nonetheless, firms with institutional investors pay less relative to firms without such investors. While the main focus of Eisert and Hirsch (2013) is the association between the agency cost of debt and the agency cost of equity and not ownership structure per se, they use the presence of blockholders to account for the severity between the two conflicts. They conclude that the severity of the cost of debt increases with an increase in the voting power of large blockholders. Therefore, I argue that the effect of ownership concentration on the cost of bank loans remains an empirical issue.

Hypothesis 1.1: *Higher institutional ownership concentration increases the total cost of borrowing as it increases the agency cost of debt, in line with the wealth redistribution hypothesis.*

Hypothesis 1.2: *Higher institutional ownership concentration decreases the total cost of borrowing as it reduces private benefits of insiders, in line with the management disciplining hypothesis.*

Corporate governance discourse also considers insider ownership as an important element of the ownership structure of a firm. While some studies have gauged a non-linear effect of insider ownership concentration on equity value and firm performance, the effect of insiders ownership on the cost of bank loans is scarce. Gordon and Pound (1993) argue that as insider ownership increases, insiders use their voting rights to expropriate firm's resources. Moreover, a higher insider ownership better aligns the incentives of equity-holders and insiders, potentially leading to asset substitution risk as noted by Jensen and Meckling (1976). Lin et al. (2011) do a cross-country analysis using hand-collected data on the ownership and control of 3,468 companies during 1996-2008. They use the difference between cash flow rights and control rights to proxy for separation of ownership

and control. In contrary to my expectations, they conclude that the cost of debt goes up as the wedge between ownership and control increases. I treat their research with caution however, because their measure of separation of ownership and control is applicable only to "pyramidal structures, dual-class shares, and multiple control chains"(Lin et al. (2011); pg. 5). In addition, my research differs from theirs as it concerns only firms incorporated in the USA. Therefore, I predict the following:

Hypothesis 2: *Higher insider ownership increases the total cost of borrowing, in line with the wealth redistribution hypothesis.*

In two akin studies, Anderson et al. (2004) and Bhojraj and Sengupta (2003) examine the role of the board of directors as a governance mechanism on the cost of debt. While board structure consists of various elements, studies mainly focus on board size, board independence and board duality to account for attributes that could diminish the agency conflicts a firm faces. In particular, Bhojraj and Sengupta (2003) focus on debt ratings and find that higher board independence is associated with higher ratings on new bond issues and lower bond yields. Anderson et al. (2004) use bond issues of S&P500 firms throughout 1993 to 1998 and report that board and audit committees composition impacts the cost of debt finance. My study differs from the above as the focus is on private debt. As Rajan (1992) shows, there are significant differences between private lenders and arm's length lenders in their ability and incentives in monitoring borrowers. Therefore, the results from previous studies on the bond market might not hold in bank loan pricing. Using 6,300 loans issued to 1,500 firms, Francis et al. (2012) also conclude that independent boards and smaller boards are rewarded with better loan terms.

The inverse relationship between board independence and the cost of debt could lie in the fact that there might be a substitution effect between board monitoring and bank monitoring incentives as argued by Agrawal and Knoeber (1996) and Carletti (2004). The impact of board size on the borrowing costs is less clear in the literature. Most research however argues that an increase in board size fails to monitor management efficiently, thereby allowing managerial entrenchment and reducing their alignment with shareholders (Yermack (1996)). This implies that a larger board might be beneficial for creditors and reduce the costs of borrowing. Imhoff (2003) maintains that governance of a firm is seriously compromised when the CEO is also chairman of the board of directors. Board

duality grants the CEO significant power that he can use to expropriate firm's resources for private benefits. Considering the above literature, I hypothesize the following:

Hypothesis 3.1: *An increase in board independence results in a lower total cost of borrowing in line with the management disciplining hypothesis.*

Hypothesis 3.2: *A smaller board increases the total cost of borrowing in line with the wealth redistribution hypothesis.*

Hypothesis 3.3.a: *Greater CEO power as proxied by board duality could increase the total cost of borrowing in line with the management disciplining hypothesis.*

Hypothesis 3.3.b: *Greater CEO power as proxied by board duality could decrease the total cost of borrowing in line with the wealth redistribution hypothesis.*

Studies that consider the impact of shareholder rights on the firm's cost of borrowing focus primarily on the existence or lack thereof of anti-takeover provisions (Klock et al. (2005); Chava et al. (2009). The idea behind this choice is the fact that takeover defences make the removal of entrenched management quite challenging, therefore reducing the power of shareholders. While Klock et al (2004) focused on the bond market and Klock et al. (2005) on the private credit agreements, both studies conclude that stronger shareholder rights as proxied by low anti-takeover provisions lead to a higher cost of debt. Bertrand and Mullainathan (2003) and Giroud and Mueller (2010) also argue that managerial entrenchment weakens the alignment of shareholders and managers as managers are less inclined to pursue risk-shifting investments and prefer a "quiet" corporate life. Following these studies and in line with the wealth redistribution hypothesis, I predict that greater shareholder rights are associated with a higher total cost of borrowing. More specifically, I investigate how the effect of the abovementioned corporate governance mechanisms affect the total cost of borrowing for different levels of shareholder rights.

Apart from minor differences in methodology, this thesis differs from the above studies as they mainly focus on the pricing terms of loans and neglect other loan terms. As Qian and Strahan (2007) point out, it is critical to consider both pricing and nonpricing terms of debt as nonpricing terms often present a cost to borrowers. In particular, they argue that banks can render more favourable rates ex ante if they are able to obtain

valuable collateralized assets ex post in case of default. Cai et al. (2012) and Bradley and Roberts (2014) argue that loan terms are determined jointly. More specifically, the former analyse how financial covenants and performance pricing provisions reduce information asymmetry and moral hazard by aligning the interests of creditors with those of borrowing firms. While there is abundant literature on how the existence of covenants influence governance of firms (see Nini et al. (2009)), little is known about the effect of governance on the choice of nonprice terms included in a loan contract. I consider more thoroughly how the internal governance mechanisms presented above affect nonprice terms of loan contracts in the second part of this dissertation.

3 Data and Descriptive Statistics

3.1 Data Sources and Sample Construction

To construct the sample, I begin with Thompson Dealscan Database which provides information on the loan starting date, loan amount, maturity, spread, fees and some nonprice terms like prepayment covenants and collateral. Additionally, Dealscan encloses information on the identity of the borrowers and lenders as well as the purposes and types of loans. A loan package may accommodate more than one loan tranche, also called facility. Although general loan contract terms and lenders' identity are commonly determined at a package level as argued by Sufi (2007) there are observable differences in facility characteristics within the same package which could influence the cost of a loan. The initial Dealscan sample consists of 143,569 facilities issued between 1997 and 2015 and involving 36,433 companies including financial firms[2].

While Dealscan provides information on the secured status of a loan and prepayment covenants, financial covenants are equally important terms that are not accessible through Dealscan.[3] To overcome this, I examine SEC filings using Edgar Database by employing

[2]I delete loans for which the all-in-spread-drawn is not based on LIBOR. Before this step, the sample consists of 209,757 facilities quoted on 61 different base rates among which the most frequently used rates are Fixed Rate, Prime, Euribor, Hibor and Tibor. Although this step reduces the initial sample size by 30%, keeping only observations priced on LIBOR eases the comparison of my results with prior similar research.

[3]Prepayment covenants require early retirement of a package conditional on firm's decisions as asset

text-search algorithms to identify the existence of financial covenants in loan packages adopting the methodology of Nini et al. (2009). I use API script to extract the identifying information for filings of my sample firms and manage to find information for 43% of my sample using the central index key (CIK) codes. In the search, I look for the mentioning of "covenant" and "financial covenant" in the 10K filings of firms as well as in their exhibits. In the end, I assign an indicator variable which equals one if the terms are present in the package agreements and zero otherwise.

I next turn to Compustat to obtain company-level financial data. As there is no unique identifier between Dealscan and Compustat, I use the DealScan-Compustat Linking Table constructed by Chava and Roberts (2008) available in WRDS.[4] The table contains the facilityid and borrowercompanyid through which I match my initial sample from Dealscan.[5] The resulting dataset contains 58,957 observations corresponding to 9,721 firms ranging from 1997 to 2012. Observations for years beyond 2012 from the initial sample are missing as 2012 is the last reporting year in the linking table. This is then my starting point to obtain firm level characteristics in Compustat using loan starting date and gvkey as firm identifier. I lag all the accounting data by one quarter relative to the facility initiation date to make sure that such information was known at the time that the loan was granted. I drop suspicious accounting values like negative assets and liabilities. Jointly, these conditions reduce the sample to 19,701 quarterly observations for 2,787 unique firms.[6]

Next, I use Thompson Institutional (13f) Holdings Database on WRDS to obtain data on the ownership structure of the firms. The database contains information on institutional

sale or issuance of securities (Bradley and Roberts (2014)). Such covenants are referred to as "sweeps" and are unique to packages. Therefore, every facility in a package is subject to all package covenants. Dealscan contains information on asset sweeps, debt sweeps, equity sweeps, excess cash flow sweeps and insurance proceeds sweeps.

[4]I am thankful to Sudheer Chava and Michael Roberts for enabling researchers and students to merge the two datasets.

[5]I notice some discrepancies in the information regarding the *facility start date* provided in the linking table compared to Dealscan and contacted WRDS representatives presenting them the respective deals for which there are inconsistencies.

[6]In order to rule out potential sample selection bias, I check for systematic differences between observations in Dealscan that were matched with Compustat and those that were not matched. I conclude that the mean pricing and maturity is higher for Dealscan facilities that could not be matched. The average facility size is however smaller for those observations. The distribution among different types of loans is similar for both samples.

managers that have more than $100 million assets under management[7]. In line with Gompers and Metrick (2001) I use the institutional ownership information disclosed on the quarter preceding the facility starting date.[8] I calculate institutional ownership as the amount of shares held by institutions divided by the amount of shares outstanding per quarter. I remove improbable observations that report institutional ownership higher than one. Drawing on other studies that investigate ownership structure (Bhojraj and Sengupta (2003); Parrino et al. (2003)) I use blockholder ownership as an alternative for institutional ownership concentration. I merge the dataset on institutional ownership with the previous sample containing loan and borrower firms' financials using CUSIP as firm identifier, year and quarter in which the loan was initiated.

To measure insider ownership, I use information available in Thompson Reuters Insiders Database.[9] To achieve this, I first identify all insiders of a given company using their Director Sequence Number (DSN) and add up their direct and indirect holdings. Indirect holdings refer to those held by the spouse, child and trust holdings. Then, I add up holdings of all insiders in a company to get a measure of the insiders fraction of ownership. Lastly, I aggregate the monthly holdings into quarterly and I merge the file with the previous dataset on deals, firm financials and institutional ownership using CUSIP year and quarter.

Next, I retrieve data on the Board of Directors from the Institutional Shareholder Services (ISS) Database available in WRDS. Due to methodological changes, the dataset is truncated into pre and post 2006. Therefore I append the two time periods adjusting for differences in variables. The appended dataset contains 27,020 yearly observations. I construct board size by adding the number of board members for a given company in a given year. I calculate board independence as the percentage of outside directors within a board. Additionally, I create indicator variables that equals one if the CEO is also chairman of the board, and zero otherwise. Merging the Boards Dataset with the master dataset containing all other information results in 6,012 unique observations. Lastly, I exclude all financial firms (2-digit SIC 60 to 64) as their riskiness may be inherently differ-

[7]The 1978 amendment to the Securities and Exchange Act demands institutions with portfolios above $100 million under management to report their positions every quarter to the Security and Exchange Commission.

[8]Namely, the reporting dates are March 31^st, June 30^th, September 30^th and December 31^st.

[9]In WRDS, insiders is defined as anyone that has access to "non-public, material, insider information".

ent than that in other industries and keep only companies whose country of incorporation is the USA.

3.2 Dependent Variable

In contrary to customary use of the all-in-drawn-spread as a measure of loan pricing, I employ a novel measure labelled as the total cost of borrowing. Berg et al. (2016) introduce this peculiar variable by providing a theoretical framework upon which they argue that the spread alone is not the most comprehensive measure to capture pricing terms of loans. They validate the view that lenders use a complex, rather than a single price measure to secure an appropriate return. The new total-cost-of-borrowing measure accounts for the spread, loan fees and the likelihood that the loan will be paid.[10] With the authors' permission, I am able to match 3,965 observations from my original sample with their dataset used to calculate the total cost of borrowing. I merge the two datasets based on the FacilityID and year. Table 1 presents the distribution of loans throughout the years in the sample and Figure 1 depicts this graphically.

[Table 1]

3.3 Control Variables

For the multivariate regression analysis, I include various control variables that have shown to influence borrowing costs in related studies. I describe below all the loans, borrowers and lenders characteristics. I report the descriptive statistics for all the variables in Table 2 while detailed information on the source and definition of the variables is reported in Appendix.

3.3.1 Borrower Firms Characteristics

To measure firms' credit quality and seize the asymmetric information between lenders and borrowers I construct financial figures relating to firms' characteristics. I use prof-

[10] More details on the total cost of borrowing and the way the measure is constructed is provided in the Appendix.

itability as the ratio of EBITDA to sales to control for firms' performance. Leverage is defined as the sum of short term and long term debt divided by book assets. This measure yields some missing values however. As leverage is one of the main firm-characteristic that determines credit spreads(Collin-Dufresn et al. (2001)), I use a leverage measure (*leverage_ accounting*) based merely on accounting data and calculated as the ratio of total liabilities and total assets. This variable is available for the entire sample of firms. I use total liabilities instead of debt since nonfinancial liabilities rank higher than debt in seniority (Welch (2011)). Market-to-Book ratio is calculated as the sum of market capitalization and book value of debt scaled by total assets. Moreover, I include a variable to measure tangibility of assets calculated as the ratio of property, plant and equipment(PPE) over total assets as a proxy for the collateral quality in event of default as noted by Lin et al. (2011). To address the concern of outliers and data errors, I winsorize the abovementioned variables at 1% on both ends. Following Roberts and Yuan (2010), I also add Altman's z-score to control for the firm's credit strength.

3.3.2 Loan Characteristics

First, I control for the facility size using the natural logarithm of the facility amount. Second, I consider the loan maturity given in months to control for prepayment risk associated with longer maturity contracts. Next, I assign three dummy variables equal to one for the presence of : collateral (*secured*), prepayment covenants and financial covenants respectively, and zero otherwise. I control for the syndicate size by adding the number of lenders for a given facility if the loan is syndicated. Rajan (1992) highlights the importance of lock-up problems inherent in established borrower-lender relationships which could increase the cost of borrowing. On the other hand, established relationships between the same borrowers and lenders could imply lower asymmetric information. Therefore, I control for the number of previous loans initiated by the same borrowers and lenders in Dealscan to capture firm information already held by lenders as noted by Sufi (2007). Additional indicators control for the loan purpose and loan type. Following Francis et al. (2012), I group loan purpose into seven categories: Corporate Purpose, Working Capital, Debt repayment/Recapitalization, Takeover, Acquisition Line, LBO and Others. I divide loan types into five categories represented by 364-day facility, Term Loan, Revolver,

Institutional Term Loan (Term Loans B-D) and Others.

3.4 Descriptive Statistics

Panel A of Table 2 presents descriptive statistics of the key variables while Panel B shows their correlation matrix. I find that the average loan price as measured by natural logarithm of the total cost of borrowing is 4.08 or 92.69 basis points. On average, there are 12 lenders comprising a syndicated loan. The average facility amount is $711 million while the mean maturity is 42 months. These results are similar to Francis et al. (2012). On average, there are 1.3 relations prior to facility initiation between the borrower and the lead bank. For more than half of my sample (2,493 out of 3,965 deals), Dealscan reports whether a loan is backed up by collateral or not. I find that almost 48% of the loans for which there is information available are secured with collateral. Additionally, Dealscan provides information on the existence of prepayment covenants. Approximately 22% of the loans in the sample contain a prepayment covenant. Revolvers with maturity more than one year are the most frequent loans comprising 52% of the sample. The second most popular loan type is the 364-day facility constituting 28% of the sample. Term loans form the third largest group within the sample with 12%. The rest of the sample consists of miscellaneous loan types. I find that corporate purpose is the most frequently stated loan purpose with 42% of the facilities belonging to this group. Commercial paper backup falls second with 17% and debt repayment third with 9% as the other most frequently cited purposes.

I find that the average board size is 9.5 members. The average percentage of outsiders on board equals 71% and in 77% of the firms the CEO is also chairman of the board. On average, about 0.7% of shares outstanding is held by insiders. Institutional ownership averages 71% of outstanding shares for the firms in my sample with blockholders holding on average 19%. My results on ownership suggest a somewhat more concentrated ownership structure relative to those in related studies of Bhojraj and Sengupta (2003) and Roberts and Yuan (2010).[11] The table shows that the average borrower size as measured by the natural logarithm of their assets is 8.5. The average market-to-book ratio is 1.78;

[11] The difference in mean statistics could result due to differences in the time sample under investigation.

the average leverage ratio is 0.32. When I consider leverage as an accounting measure however, the average leverage measure is 0.63. The average profitability is 0.17 and the average z-score is 0.94. Tangibility as scaled by assets averages 0.37. Other statistics show that about 60% of the firms in the sample are investment grade companies.[12] The average term spread equals 1.15 and the average credit spread equals 0.97. Such results are quantitatively similar to Chava et al. (2009) and Francis et al. (2012).

Univariate correlations in Panel B show that banks charge a lower price for larger loans and loans with shorter maturity. In addition, previous relations between the same borrowers and lenders as well as syndicate size are inversely related to the total cost of borrowing. Bigger firms, less leveraged firms and more profitable firms pay a lower price for their borrowings. The total cost of borrowing is correlated negatively with the z-score suggesting that firms with a lower credit risk obtain more favourable prices. Furthermore, board size, board duality and board independence are negatively related to the total cost of borrowing. Among board attributes, board size and board duality are highly correlated. The presence and concentration of institutional ownership is associated with a higher cost of borrowing.

4 Empirical setting

4.1 Preliminary analysis

In this section I initially present some exploratory results before advancing to the main regression analysis. To check for potential non-linear relationship between institutional ownership and borrowing costs as suggested by previous literature, I split the entire sample into deciles based on the level of institutional ownership. Table 3 shows that for firms in the lowest deciles, the average cost of borrowing decreases as firms move to higher deciles of institutional ownership. However, this pattern does not persist through the entire sample. The cut-off point is at the fifth decile, after which there is a positive relation between the total cost of borrowing and institutional ownership. Such unrestricted univariate analysis suggests that there is indeed a non-linear relationship between the

[12]Investment grade companies are those that have a rating higher than BBB- based on the S&P ratings.

loan pricing and institutional ownership. Figure 2 depicts this relationship graphically.

[Table 3]

Although this analysis is insightful for grasping the link between the cost of borrowing and institutional ownership, it does not establish conclusive testimony that higher institutional ownership leads to a higher cost of borrowing. The presented pattern above could be driven by other firm-specific or loan-specific factors. To reign over potential factors that may have an impact on the price of a loan and elicit relevant inferences, I employ a pricing model that considers other governance mechanisms as well as control variables that have been found to have a substantial effect on loan pricing by prior literature.

[Figure 2]

4.2 Regression analysis

I draft the following general pricing model to investigate the relationship between governance and the total cost of borrowing.

$$\begin{aligned} ln(TCB) = {} & \beta_0 + \beta_1 * Institutional\ Ownership + \beta_2 * Institutional\ ownership^2 \\ & + \beta_3 * Insider\ Ownership + \beta_4 * Board\ Size + \beta_5 * Board\ Duality \\ & + \beta_6 * Board\ Independence \\ & + \beta_7 * \sum Loan\ Characteristics \\ & + \beta_8 * \sum Borrower\ Characteristics \\ & + \sum Industries + \sum Years + \mu \end{aligned} \tag{1}$$

run the regressions at a facility level as the main unit of observation while the dependent variable is the natural logarithm of the total cost of borrowing[13]. To investigate the potential non-linear relationship between institutional ownership and the borrowing cost, I include a variable which equals the square of institutional ownership. Variables that measure the board characteristics include board size, board duality and board independence. Additional control variables control for various firm-specific characteristics

[13]Final results are qualitatively comparable when I use the raw total cost of borrowing measure without the logarithm conversion.

and loan attributes. Furthermore, I employ one-digit SIC indicators to seize unobserved heterogeneity among different industries[14]. I include year indicators in all regressions to account for economic conditions at the time the facility is originated. Table 4 presents the pooled OLS regression coefficients for various specifications of the model with reported standard errors clustered at firm level and robust to heteroskedasticity. [15]

[Table 4]

Column (1) in Table 4 presents the model estimating the impact of institutional ownership on the total cost of borrowing. The coefficient of institutional ownership term is -1.459 and statistically significant at the 10% level. The coefficient of the squared term is 1.092 and statistically significant at the 5% level. Moreover, the influence of institutional ownership is economically significant. The results imply that an increase by one standard deviation in institutional ownership reduces the total cost of borrowing by 21 basis points, which in turn translates to a 5.12% decrease from its mean. This finding supports the univariate analysis suggesting a non-monotonic relation between institutional ownership and the total cost of borrowing. In particular, the relation exhibits a seemingly U-shaped pattern with the total cost of borrowing decreasing with institutional ownership when the latter is low and increasing with institutional ownership when the latter is high. Therefore, the overall effect on the cost of borrowing legitimately depends on the initial level of institutional ownership. For instance, when institutional ownership equals 0.1, a one percentage point increase (from 0.10 to 0.11) leads to a decrease in the total cost of borrowing by 1.2%. However, if the institutional ownership is very concentrated at for instance, 0.8, then an increase by one percentage point in ownership leads to an increase in the cost of borrowing by 0.3%.

Figure 3 presents graphically the relation between institutional ownership and the total cost of borrowing based on the results from Column (1). To make easier inferences in terms of the cost of borrowing, I compute the effect of institutional ownership on the natural logarithm of the total cost of borrowing over the sample mean and then convert the results in basis points. Based on Figure 3, it is evident that the relation

[14] I use one-digit SIC instead of two-digit SIC as often done by research to retain the degrees of freedom as some industries have very little firms in them when I employ the two-digit SIC.

[15] I check whether multicollinearity concerns exist throughout all the regressions in this section. The maximum variance inflation factor (VIF) is 6.28, which is below the threshold of 10.

is not linear over different concentrations of institutional ownership. The results are in line with Roberts and Yuan (2010) who also advocate the existence of a U-shaped relationship between institutional ownership and the all-in-drawn-spread. Their inflexion point however is somewhat lower, at around 62% of institutional ownership. Overall, the results show that banks take into consideration the ownership structure of a firm and charge higher spreads to firms with highly concentrated institutional ownership to cushion against potential risk shifting.

[Figure 3]

Column (2) in Table 4 investigates the effect of insider ownership concentration on the total cost of borrowing. The coefficient is positive and significant at the 5% level. Notably, the effect is of sizeable economic significance. Controlling for other factors, one standard deviation increase in insider ownership results in 3.9 basis points increase in the total cost of borrowing, or alternatively a 0.95% increase from its mean. The result recognizes the concern of lenders for potential risk shifting as equity holdings by insiders increase, in line with the wealth distribution hypothesis. My finding on insider ownership complements the results of Ashbaugh-Skaife et al. (2006), who uncover an inverse relation between insider ownership and firms' credit ratings.

Column (3) in Table 4 examines the effect of board structure on the total cost of borrowing. The main focus is on three board characteristics, namely: board size, board independence and board duality. Among the three attributes, the effect of board size on the total cost of borrowing is significantly negative at the 10% level. The coefficient implies that an additional member on board reduces the total cost of borrowing by 1.39%. The result on board size supports the *Wealth Distribution Hypothesis* building on the assumption that larger boards are less effective in monitoring managers as pointed out by Yermack (1996). The concern of banks regarding the alignment of managers and equity-holders results in lower borrowing costs for firms with larger corporate boards. My findings on board structure are in line with the study of Anderson et al. (2004) which finds an inverse relationship between the cost of public debt and the size of corporate boards. The results are also consistent with Francis et al. (2012) who conclude that a larger board size reduces the cost of bank loans as measured by the all-in-drawn-spread. I do not find a significant impact of board duality on the total cost of borrowing. Additionally, the

coefficient on board independence is insignificant at conventional levels of significance. It is worth noting that while board duality and board independence do not exhibit a significant effect separately, they are jointly significant at the 10% level (Prob>F=0.0533). Moreover, the lack of statistical significance could be a result of not accounting for potential interdependencies between the total cost of borrowing and nonprice terms of loan contracts, as I show in latter sections.

The last column provides the full model with the entire set of governance mechanisms analysed simultaneously in one single regression. Interestingly, the effect of institutional ownership is similar to Model (1) but the cut-off point for the change in signs is at lower levels of concentration. Additionally, insider ownership retains its positive on the borrowing cost at 10% significance level. The coefficient is smaller in magnitude indicating that an increase in insider ownership by 1 percentage point leads to an increase in the TCB by 1%. Board size remains significant at the 5% level although the coefficient is smaller. The effect of board duality and board independence on the total cost of borrowing remains statistically insignificant as in the previous specifications.

I next turn to the impact of firm-specific and loan-specific variables on the total cost of borrowing. In all specifications, firm size is negatively related to the natural logarithm of TCB at the 1% level [16] suggesting that larger firms pay a lower price for borrowing. In addition, an increase in firm's leverage increases the total cost of borrowing significantly. I also find a significant negative relationship between the Altman's z-score and the cost of borrowing. The coefficients imply that firms with low credit risk as proxied by a higher z-score obtain more favourable loan pricing. Such results are consistent with the univariate correlations presented in Section 2 and support findings of previous literature (see e.g,Strahan (1999); Chava et al. (2009)).

Interestingly, I find that loan maturity is inversely related to the logarithm of the TCB. The result might seem puzzling at first, as one would expect the price to increase as maturity increases due to higher prepayment risk in longer maturity contracts. This puzzle is resolved however when considering that banks do not only use the pricing term

[16]Firm size measured as either the natural logarithm of total assets or market capitalization, is highly correlated with the loan amount ($corr = 0.61$). Therefore, when I control for both firm size and loan size, one of the variables becomes insignificant. However, the exclusion of either variable from the regression does not influence the significance of the governance measures.

of a loan as a mechanism to price risk, but also non-pricing terms like covenants and collateral. In order to draw meaningful conclusions, we also need to look also at the marginal effects of maturity on the existence of certain non-pricing terms. I perform this analysis in latter sections of this dissertation.

The syndicate size however has a negative effect on TCB when I consider the model with the entire range of governance mechanisms. In particular, it appears that one more participating bank in a syndicated loan reduces the price at which a firm can borrow by 0.24%, ceteris paribus. As previously noted by Sufi (2007) and Ivashina (2009) who examine the risk-taking behaviour of lenders, a larger syndicate allows for more diversification, exposing banks to less credit and liquidity risk. Although investigating lenders' involvement in a syndicate is beyond the scope of this dissertation, my findings on syndicate size seem to follow their reasoning hinting at an inverse relation between the syndicate size and the pricing of loans. Other result on control variables show that firms with an investment grade rating and firms with more growth prospects as measured by the market-to-book ratio borrow at more favourable rates, regardless of the model specification.

4.3 The role of capital structure : Leverage channel

Hart (1995) concludes that the capital structure of a firm is an important device in moderating the creditor-shareholder conflict of interest. Therefore, I assume that capital structure can affect the established relationship presented in the main analysis between governance mechanisms and the total cost of borrowing. I base my assumption on three main arguments considered often in corporate finance research. First, debt can act as a deterring mechanism for suboptimal use of capital because it reduces the free cash flows as initially noted by Jensen and Meckling (1976). Due to its seniority, loan debt has high priority and typically reduces management's discretion over firm's resources. Second, creditors are likely to have more control over the firm when firms are highly leveraged (see Burkart et al. (1997); Chava and Roberts (2008) ; Roberts and Sufi (2009)). Along this line of reasoning, I argue that more control in the hands of lenders for high leverage borrowers reduces the monitoring needs provided by corporate governance mechanisms.

Third, high leverage firms are less attractive in the market for corporate control as noted by Novaes (2002) and Chava et al. (2009).

Overall, the theoretical arguments posed above indicate that leverage is a good proxy for risk-shifting incentives. Going back to my original hypotheses, I expect a less negative effect of institutional ownership on the total cost of borrowing for highly leveraged firms as risk-shifting incentives increase significantly. Likewise, higher insider ownership increases moral hazard in high leverage firms as most of the downsize risk is absorbed by the lender. That gives insiders an incentive to engage in asset substitution whenever they have some discretion over firm's capital as predicted by the wealth redistribution hypothesis. Furthermore, as the impact of board structure on the borrowing costs depends on the monitoring needs of the borrower, I expect board size to have a less pronounced negative effect for high leverage firms.

In line with Chava et al. (2009), I divide the sample of firms into terciles based on the level of leverage and generate two indicator variables : *high leverage*, representing firms in the top tercile and *low leverage* which represents firms in the lowest tercile. Then I include the two dummies along with their interaction terms with individual governance mechanisms in the main regressions as presented in the analysis above. Along these lines, the coefficients of the interaction terms provide insight of the effect of leverage relative to the group of firms that belong to neither the highest nor the lowest division. Model (1) in Table 5 presents the specification on institutional ownership including the leverage dummies and the interaction terms. The coefficients on institutional ownership terms display the non-monotonic pattern as before. The interaction term of institutional ownership and low leverage is positive and significant at the 10% level. Remarkably, it indicates that low leverage borrowers pay more relative to mid-leverage borrowers as institutional ownership increases. The coefficient on *institutional ownership*high leverage* is however close to zero and insignificant.

In Model (2), I present the effect of insider ownership on the total cost of borrowing as intensified by leverage. There is a noteworthy increase in the effect of insider ownership on the TCB for highly leveraged firms relative to firms in the middle range of leverage. Economically, the results suggest an 8.57% increase in the TCB as insider ownership increases by one percentage point, ceteris paribus. This finding supports the hypothe-

sis that, for firms with high risk shifting incentives, a higher alignment of insiders and shareholders is detrimental for creditors' comfort. There is no significant effect of the interaction between low leverage and insider ownership however. I do not find a significant effect of board size on the TCB for highly leveraged firms. Lastly, an increase in board size leads to a 2.46% decrease in the total cost of borrowing for firms with high leverage as compared to firms in the middle. The results in Model (4) which takes into account the whole set of mechanisms simultaneously are of similar sign and magnitude as in the models in which mechanisms are taken separately.

[Table 5]

4.4 Shareholder rights and the market for corporate control : further evidence

To inspect the importance and vigorousness of the main results, I complement the analysis with additional data to measure shareholder rights. As the agency cost of debt arises from the conflict of interest between shareholders and debtholders, weaker shareholder rights could potentially moderate the relationship between internal governance mechanisms under investigation and the total cost of borrowing. Klock et al. (2005) and Chava et al. (2009) claim that weaker governance as proxied by the existence of anti-takeover provisions mitigates the equityholder-debtholder conflict. More precisely, the authors argue that the existence of anti-takeover provisions entrenches managers and brings about misalignment between shareholders and management as managers are less inclined to pursue risk-shifting investments. In this vein, the resulting higher agency cost of equity could be associated with a lower agency cost of debt.

In contrast with previous studies which rely on the GIM-Index to proxy for shareholder rights, I use the Entrenchment Index(hereafter EI) constructed by Bebchuk et al. (2008). As the GIM Index stops reporting in 2006, it is immaterial for the sample period of my research. I use data from the Governance and Governance Legacy dataset accessible in the Institutional Shareholder Services to create the measure. The index consists of six governance provisions which account for constitutional shareholder rights and takeover readiness. It gauges how entrenched managers are by considering the existence of staggered

boards, limits to amendments of bylaws, golden parachutes, poison pills, supermajority requirements for charter amendments and supermajority requirements for M&As. Every company is assigned one point if it contains one of the above anti-takeover measures. A high score on the index suggests that managerial entrenchment is high as opposed to shareholder rights. Due to different sources, I could match 2,245 observations from the original sample with the Entrenchment Index measure. To test whether weaker shareholder rights alleviate the sensitivity of the cost of borrowing to internal governance, I interact the terms of institutional ownership, insider ownership and board structure with the index.

Table 6 reports the estimated coefficients for the models as presented in the main regression analysis along with their interactions with the Entrenchment Index. All models include all the control variables used in Table 4, however I report only the main variables of interest. Column 1 shows that institutional ownership and its interaction with the index is not statistically significant. The effect of insider ownership concentration remains positive and statistically significant at the 5% level. Moreover, the interaction term between insider ownership and entrenchment index is negative and highly significant at the 1% level. Accordingly, the effect of insider ownership on the total cost of borrowing is weaker for high levels of entrenchment. In terms of economic significance, one percentage point increase in insider ownership when the Entrenchment Index is low, (say EI=1) results in a 1.37% increase in the total cost of borrowing. However, if the Entrenchment Index equals two, the effect is smaller, resulting in a 0.3% increase. The result on insider ownership suggests that insider holdings should not significantly influence the cost of debt once insiders' control gets buffered by anti-takeover provisions. This argument stems from the hypothesis that banks are concerned about the threat of a takeover as it could increase the financial risk of firms (see Klock et al. (2005); Chava et al. (2009)) Consequently, once insiders' power increases sufficiently and the probability of a takeover decreases, the impact of insider ownership concentration on the borrowing costs is not that strong[17] . This in turn implies that insiders may utilize their voting power and potentially thwart shareholder-backed proposals for their private benefits if the firm is

[17]Even though insider ownership is a measure that captures direct and indirect shareholdings of officers and directors, the majority of holdings consists of officers' equity holdings. Therefore, the measure better represents management's interest rather than incentives of boards to serve shareholders and invigilate management.

highly entrenched. The results on insider ownership remain robust even when considering the whole set of governance mechanisms simultaneously in Model 4. Although individual board mechanisms appear statistically insignificant, a F-test of joint significance shows that simultaneously they are significant at the 1% level.

[Table 6]

4.5 Corporate Governance and Nonprice Terms of Loans

Prior research on loan contracting agrees that banks use both price and nonprice terms simultaneously to deal with borrowers' risk (see Asquith et al. (2005); Roberts and Sufi (2009)) Accordingly, banks customize price and nonprice terms to account for borrowers' monitoring needs, credit and liquidity risks. The most investigated nonprice terms of loan contracts are collateral, covenants and performance pricing provisions. Banks use collateral as a mean to control for information asymmetry and agency risk (Rajan and Winton (1995)). Covenants are conditions that either encourage or restrict behaviour of borrowers. Research shows that agency cost considerations and expectation of future renegotiations determine the type of covenants included in a loan agreement (see Bradley and Roberts (2014))[18] Performance pricing terms are relatively new terms that vary the interest rate on a loan contingent on borrower's performance and creditworthiness (Cai et al. (2012)) . En masse, non-pricing terms serve as screening devices to reduce potential losses that lenders face. Quality corporate governance can additionally reduce the information asymmetry between banks and firms by providing effective information disclosure. To this end, it is important to inspect whether corporate governance influences the choice of nonprice terms as both could serve as tools to reduce moral hazard. Therefore, there could be a substitutive effect between the two that needs to be taken into account when drawing conclusions on the overall cost of loans. In complement to the main results on the total cost of borrowing reported earlier, I explore how different aspects of governance affect non price terms.

Due to a lack of information on Dealscan regarding pricing performance grids[19], I focus on

[18] Although common, renegotiation of loan contracts is beyond the scope of this paper. Therefore, I only focus on the choice of covenants considering agency costs between shareholders and creditors.

[19] Information on performance pricing is restricted to individuals having a researcher's account on Dealscan.

prepayment covenants, financial covenants and collateral as terms that could be affected by firm-level governance. To do this, I rely on the following logistic model that considers how internal governance mechanisms influence the likelihood of the existence of collateral, prepayment covenants and financial covenants.

$$\begin{aligned} Pr(Y=1) = \beta_0 &+ \beta_1 * Institutional\ Ownership + \beta_2 * Insider\ Ownership \\ &+ \beta_3 * Board\ Size + \beta_4 * Board\ Duality + \beta_5 * Board\ Independence \\ &+ \beta_6 * \sum Loan\ Characteristics + \beta_7 * \sum Borrower\ Characteristics \\ &+ \beta_8 * Rating + \sum Industries + \sum Years, \end{aligned}$$

where Y={Collateral, Prepayment Covenant, Financial Covenant}

Table 7 reports the estimated average marginal effects of the entire set of governance mechanisms on the probability of loans having nonprice restrictions. Model (1) explores the likelihood of the existence of a prepayment covenant as a function of governance. The marginal effect of institutional ownership on the probability of a contract having a prepayment covenant is significant at 10% level. Specifically, as institutional ownership increases by one percentage point, the probability of having a prepayment covenant in place increases by 0.156%. In addition, board size has a significant marginal effect by reducing the likelihood of a prepayment covenant by 0.9% as board size increases with one more additional member. The result on board size is consistent with the arguments posed in the main analysis that larger boards are less capable of catering shareholders' interests and thus perceived as beneficial from creditors.

Model (2) shows the average marginal effects of governance on the existence of a financial covenant. The effect of institutional ownership is again significant at 10% level. The coefficient indicates that the change in probability of imposing a financial covenant decreases by almost 0.25 percentage points for one percentage point increase in institutional ownership. The results on prepayment covenants support the view that banks rely on covenants to impede management's behaviour that may cause devaluation of debt. Nonetheless, the finding on the relation between institutional ownership and the likelihood of financial covenants is puzzling. It is reasonable to expect more covenant re-

strictions as lenders concerns' of asset substitution increase with institutional ownership. The results however could be an indication of potential endogeneity affecting nonprice loan terms. I deal with this issue in the next section of the thesis.

Model (3) displays the logistic model using the presence of collateral as the dependent variable. While there is no significant marginal effect of institutional ownership on the likelihood of a loan being secured, board structure seems to matter. Notably, an increase in board size with one member decreases the change in probability of a loan being secured by 1.47 percentage points. The average marginal effect of board independence on the presence of collateral is also significant at the 1% level. Remarkably, an increase in board independence reduces significantly the probability of collateral being demanded. The result suggests that lenders assume that the ex post risk of firms with fewer independent directors is higher than that of firms with more independent directors. Consequently, lenders are more likely to demand the former ex ante protection by requesting securitization of the loan.

4.6 Considering simultaneity among pricing and non-pricing terms

While counterintuitive at first, the negative effect of maturity on the total cost of borrowing shown in my main regression analysis might be indicative of some simultaneity among contract terms. Dennis et al. (2000) and Bradley and Roberts (2014) argue that loan contract terms are determined in conjunction with each other. Hence, considering loan terms separately as done thus far might yield inconsistent estimates on the effect of governance on the cost of loans. By adopting the methodology of Nelson and Olson (1978) on simultaneous equation models with limited dependent variables, I take into account the concurrence between price and nonprice terms. I treat the natural logarithm of the total cost of borrowing, Dummy(Collateral) and Dummy (Covenant) as three jointly endogenous dependent variables. For the purpose of this analysis, I do not distinguish between financial and prepayment covenants. Instead, I generate a new indicator variable which takes the value of one if either covenant is in place, and zero otherwise. Consistent with the research of Asquith et al. (2005), I allow for Dummy (Collateral) and Dummy(Covenant) to have an effect on the total cost of borrowing and not vice versa. I

use exclusion restrictions which can be thought of as instruments to explore simultaneity. Credit spread and term spread serve as exclusion restrictions for the total cost of borrowing. Credit spread is the difference between Baa and Aaa corporate bond yields while term spread is the yield difference between 10-Year and 2-Year Treasury bonds.[20] expect a positive correlation between credit spread and the total cost of borrowing as the credit spread increases in recessions and decreases in expansions. On the other hand, I expect a negative correlation between term spread and the total cost of borrowing as a higher term spread indicates favourable economic conditions (Graham et al. (2008)).

Next, I use loan concentration calculated as the ratio of the facility amount to total firm debt as an exclusion restriction for the secured status of a loan, Dummy(Collateral). Denis (2001) argue that the likelihood of demanding collateral is higher if the facility amount represents a significant portion of the total debt of the firm. Lastly, I use the indicator variable Regulated, as an exclusion restriction for the presence of covenants. The indicator equals one if the firm belongs in the utility industry (SIC 4900-4999). As the utility industry is highly regulated, I expect firms in this industry to have less serious agency problems leading to less covenant restrictions.

The structural models take the form below:

$$\begin{aligned} ln(TCB) = {} & \beta 0 + \beta 1 * Covenant + \beta 2 * Covenant + \beta 3 * Institutional\ Ownership \\ & + \beta 4 * Institutional\ ownership^2 + \beta 5 * Insider\ Ownership \\ & + \beta 6 * Board\ Size + \beta 7 * Board\ Duality + \beta 8 * Board\ Independence \\ & + \beta 9 * \sum Loan\ Characteristics + \beta 10 * \sum Borrower\ Characteristics \\ & + \sum Exclusion\ Restrictions + \sum Industries + \mu \end{aligned} \tag{2}$$

where the exclusion restrictions for the total cost of borrowing are credit spread and term spread.

[20] I obtain data on yields using the Economic and Research Database of the Federal Reserve page.

$$
\begin{aligned}
Pr(Collateral) = {} & \beta 0 + \beta 1 * Covenant + \beta 2 Institutional\ Ownership \\
& + \beta 3 * Institutional\ ownership^2 + \beta 4 * Insider\ Ownership \\
& + \beta 5 * Board\ Size + \beta 6 * Board\ Duality + \beta 7 * Board\ Independence \\
& + \beta 8 * \sum Loan\ Characteristics + \beta 9 * \sum Borrower\ Characteristics \\
& + \beta 10 * Exclusion\ Restriction + \sum Industries + \sum Years + \mu
\end{aligned} \tag{3}
$$

, where the exclusion restriction for the existence of collateral is loan concentration.

$$
\begin{aligned}
Pr(Covenant) = {} & \beta 0 + \beta 1 * Collateral + \beta 2 * Institutional\ Ownership \\
& + \beta 3 * Institutional\ ownership^2 + \beta 4 * Insider\ Ownership \\
& + \beta 5 * BoardSize + \beta 6 * Board\ Duality + \beta 7 * Board\ Independence \\
& + \beta 8 * \sum Loan\ Characteristics + \beta 9 * \sum Borrower\ Characteristics \\
& + \beta 10 * Exclusion\ Restriction + \sum Industries + \sum Years + \mu
\end{aligned} \tag{4}
$$

, where the exclusion restriction for the existence of covenant is dummy variable(Regulated).

Initially, I run reduced-form OLS and logit regressions for each of the three dependent variables. The fitted values of each dependent variable are then added on the right side of the corresponding equation in the second stage of the structural equation. Table 8 presents the results from two-stage estimations of the structural model. For brevity, I display only the second stage results of the structural model for the total cost of borrowing.[21] As shown, the presence of collateral is positively related to the total cost of borrowing. The relationship is significant at the 1% level. The coefficient suggests that facilities with a higher cost of borrowing are also more likely to be secured. Furthermore, there is a positive significant relation between the cost of borrowing and the presence of covenants. Although less significant, it suggests that the firms with more covenant restrictions also pay higher price for their borrowings.

[21] Intermediate steps are available upon request.

Notably, the non-linear effect of institutional ownership on the total cost of borrowing observed in the main analysis remains robust to the new specification. Moreover, the coefficient on board independence is significant and indicates that an increases in the percentage of independent members raises the total cost of borrowing significantly. Interestingly, after controlling for simultaneity among terms, I find a negative impact of board duality on the total cost of borrowing. The negative relation suggests that banks favour firms with dual corporate boards. By and large, the results hinge at the fact that lenders are less concerned about the managerial entrenchment and consumption of private benefits by insiders, and more worried about potential wealth distribution.

5 Robustness Checks

To corroborate on my previous findings of institutional ownership, I use institutional blockholders as a more refined proxy for ownership concentration. Results reported in Model (1) of Table 9 support the non-linear effect of institutional ownership on the TCB. The coefficients on blockholder concentration are significant and of expected signs. Estimates suggest that one standard deviation increase in blockholder ownership decreases the total cost of borrowing by 5.7 basis points, a decrease of 1.39% from its mean ceteris paribus. This is a much smaller reduction in TCB relative to the 21 basis points decrease when I use institutional holdings as a measure of concentration. That implies that lenders worry more about the presence of large blockholders as they can exert more power on management relative to smaller institutional investors. All things considered, my results on institutional and blockholder ownership concentration support the earlier hypothesis that wealth redistribution concerns of creditors are heightened for high levels of concentration. Additionally, I use board size scaled by total assets of a firm as using the number of directors alone to capture board size might give more weight to larger firms. Results presented in Model (2) of Table 9 reveal that the coefficient of board size is not statistically significant.

Empirical deliberation on private credit agreements advocates the presence of endogeneity within loan terms. Strahan (1999) and Dennis et al. (2000) argue that loan maturity is endogenous as loan contracts often determine simultaneously the spread and the loan

maturity. To deal with such concerns, I adopt a two-stage-least-square (2SLS) regression model following Graham et al. (2008)) by taking asset maturity as an instrumental variable for the loan maturity. Asset maturity is a reliable instrument as it is positively correlated with the loan maturity and is not likely to have an impact on the loan spread[22]. I first regress loan maturity on asset maturity and then I plug the predicted value of loan maturity on the right hand of the regression in the second stage. Model (1) in Table10 presents results from the 2SLS model. The instrumental variable regression does not distort the central findings of this research. Interestingly, board duality displays a positive impact on the total cost of borrowing at conventional levels of significance.

Furthermore, I consider the possibility that loans with very high total cost of borrowing could drive the results. Therefore I perform a regression based on the median total cost of borrowing as the dependent variable. Model (2) in Table 10 presents the results of the regression. While the coefficients on institutional ownership are similar in sign to the main analysis, they are not statistically significant. However, insider ownership is highly significant at the 1%level indicating an increase by 0.62% for a one percentage point increase in insider ownership. Additionally, results on board size confirm the findings in the main regression analysis.

While in all the regressions I control for firm characteristics that are observable and have shown to influence the cost of borrowing, there could be latent firm attributes that are stable over time and influence the borrowing costs. To deal with potential unobservable firm specific factors which are time-invariant, I employ a firm-year fixed effect analysis. Model (3) in Table 10 presents the fixed effects model. Results indicate a significant effect of insider ownership and board size on the total cost of borrowing. The coefficients are similar in sign and larger in magnitude relative to the coefficients in the main analysis.

Since the basic unit of my analysis is a facility and a firm can have many facilities in a given year, I face the problem that some facilities could be interrelated to each other. As a result, the statistical significance of the main results might be overstated as noted by Graham et al. (2008). While many studies use the largest facility a firm obtains in a year to correct for this, such method produces erratic inferences as it puts

[22]Bharath et al. (2008) provide extensive commentary on how asset maturity does not have an impact on loan price and neither does it influence the residual of the spread regression.

the entire weight on the largest facility. To cope with this, I aggregate facilities into a master loan for every firm in a given year. More specifically, I compute average loan features like spread, maturity, syndicate size by weighting them by the facility amount[23]. Results in Model (4) displayed in Table 10 show that board size and board duality have a significant influence on the total cost of borrowing. While board size retains its negative sign similar to all regressions throughout this thesis, the coefficient on board duality is positive. This is in contrary to the finding on board duality in Table 8 after controlling for simultaneity among price and non-price terms. The finding instead suggests that a dual board increases the total cost of borrowing, ceteris paribus. This implies that while concerned about wealth redistribution, banks would not reward firms where CEO is powerful enough to potentially capture the board of directors.

6 Discussion

This comprehensive analysis of the relevance of corporate governance from creditors' viewpoint adds to the understanding of diverging interests of different stakeholders and how that can consequently drive the firm's cost of capital. Evidence presented above shows that governance attributes which grant relatively more power to shareholders may have wealth redistribution repercussions which leaves creditors worse off. Being rational, banks take this risk into account by lending at less favourable terms. While traditionally stronger governance is seen isomorphic to the alignment between management and shareholders, stronger governance in the context of shareholder interest is penalized by a higher cost of debt.

It stands to reason why lenders might prefer non-alignment. Having more indulgence in firms with less alignment, managers are better able to implement projects in line with their risk preferences. As cited in the theoretical background, managers exhibit risk aversion as they have a considerable fraction of wealth and human capital invested in the firm. This inclination of managers coincides with creditors' preference for low risk projects. Additionally, it is more difficult to dismiss management in firms with highly entrenched

[23]Note that this method does not allow me to control for the loan type and loan purpose as they are discrete variables.

managers. As banks have to consecutively deal with the same management due to the longer tenure, they might better monitor the firm. This is however an assumption that needs to be tested further empirically.

Overall, the findings have relevant implications for the architecture of firm's optimal practices of corporate governance. As creditors and equityholders view corporate governance differently, care must be taken when implementing amendments in the governance practices of firms.

7 Conclusion

In this thesis, I examine the role of corporate governance in the bank loan setting. My study serves as an improvement to prior research by exploring the effect of an exhaustive set of governance mechanisms on the price and non-price terms of loans. First, I find that ownership structure of firms is an important factor in influencing the cost of borrowing. More specifically, results suggest a non-monotonic relation between institutional ownership and the total cost of borrowing. In addition, banks charge higher rates to firms whose insiders own a significant portion of firm's equity. The results of the effect of insider ownership on the total cost of borrowing amplify for firms with a high leverage. This implies that banks' concern of asset substitution is heightened considerably for firms with significant risk shifting incentives. Interestingly, insider holdings do not significantly influence the cost of debt once insiders' control gets buffered by the presence of anti-takeover provisions.

Second, evidence shows that different board attributes influence the borrowing costs depending on the model specification. A larger board size is notably associated with a lower cost of borrowing and a lower likelihood of banks imposing non-price restrictions like collateral and prepayment covenants. Furthermore, once accounting for simultaneity among price and nonprice terms, I find that banks charge lower prices to firms whose CEO serves also as chairman of the board. In addition, board independence appears to significantly increase the total cost of borrowing after allowing for joint determination of contract terms.

While several studies have established the influence of loan terms on firm's governance even outside default states (see Roberts and Sufi (2009); Nini et al.,2012), my findings grant support for the existence of a reverse relationship by showing that certain governance attributes affect the loan design. This two-way interactive relationship can serve as a starting point in developing a more profound theory on how this simultaneity can be exploited by firms to obtain more favourable lending terms.

The main limitations of this thesis stem from data quality. While the results on TCB yield comparable results to similar studies that use the all-in-drawn-spread, it would be insightful to decompose the measure and analyse whether banks use fees to screen borrowers based on their corporate governance. However, this further step would require access to more data sources. In addition, while I check for interdependencies among price and non-price terms, there could also be simultaneity among non-price terms alone. Future research can build on this and explore the effect of governance while correcting for joint determination of non-price terms. This could result in a better understanding on the choice of loan terms contingent on firm governance. Furthermore, future work could explore how certain governance attributes can create value for equityholders at the expense of creditors and vice versa.

8 References

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9 Appendix

9.1 Appendix A: List of Tables

Table 1

Distribution of loans and firms across the years.

The number of firms and facilities is only 6 in 2012 after matching with the dataset of Berg et al. (2015) to obtain the total cost of borrowing measure.

Year	Nr.facilities	Nr.borrowing firms
1998	213	126
1999	225	148
2000	340	209
2001	401	261
2002	380	261
2003	385	292
2004	399	285
2005	407	284
2006	331	240
2007	232	165
2008	118	94
2009	66	52
2010	130	96
2011	332	234
2012	6	6
Total	3,965	2,753

Table 2

Descriptive Statistics and Correlation Matrix

Panel A: Descriptive Statistics

	VARIABLES	N	Mean	Std.Dev	25th Percentile	50th Percentile	75th Percentile
Dependent Variable	TCB (ln)	3965	4.088	0.925	3.374	3.966	4.741
Governance	Institutional Ownership	3963	0.717	0.171	0.600	0.731	0.839
	Block Ownership	3342	0.191	0.117	0.096	0.168	0.253
	Insider Ownership	3965	0.007	0.035	0.000	0.000	0.002
	Board Size	3965	9.511	2.585	8.000	9.000	11.000
	Board Independence	3965	0.710	0.169	0.625	0.750	0.833
	Board Duality	3965	0.777	0.417	1.000	1.000	1.000
Loan Specific	Facility amount (ln)	3965	19.808	1.082	19.114	19.807	20.500
	Maturity	3965	42.611	24.253	12.000	48.000	60.000
	Syndicate size	3965	12.909	9.341	6.000	11.000	17.000
	Previous relation	3965	1.320	1.300	0.000	1.100	1.790
	Dummy(collateral)	2493	0.483	0.500	0.000	0.000	1.000
	Dummy(covenant)	3965	0.218	0.413	0.000	0.000	0.000
Firm Specific	Leverage accounting	3965	0.632	0.157	0.538	0.637	0.735
	Profitability	3105	0.170	0.179	0.091	0.149	0.231
	Total Assets (ln)	3965	8.506	1.284	7.558	8.376	9.484
	MTB	3956	1.785	1.051	1.169	1.450	1.997
	Investment Grade (IG)	3965	0.596	0.491	0.000	1.000	1.000
	Tangibility	3951	0.367	0.232	0.173	0.322	0.544
	Z-score	992	0.947	0.524	0.585	0.965	1.276
Loan Purpose	Acquisition line	3965	0.030	0.169	0.000	0.000	0.000
	LBO/MBO	3965	0.012	0.109	0.000	0.000	0.000
	Takeover	3965	0.094	0.292	0.000	0.000	0.000
	Debt Repay/Recapitalization	3965	0.095	0.293	0.000	0.000	0.000
	Corporate Purpose	3965	0.383	0.486	0.000	0.000	1.000
	Working Capital	3965	0.163	0.370	0.000	0.000	0.000
	Others	3965	0.214	0.410	0.000	0.000	0.000
Loan Type	364-day Facility	3965	0.267	0.442	0.000	0.000	1.000
	Term Loan	3965	0.114	0.318	0.000	0.000	0.000
	Revolver	3965	0.531	0.499	0.000	1.000	1.000
	Institutional Term Loan	3965	0.075	0.263	0.000	0.000	0.000
	Others (Loan)	3965	0.014	0.117	0.000	0.000	0.000
Market Rates	Credit Spread	3965	0.972	0.334	0.790	0.890	1.110
	Term Spread	3965	1.151	1.012	0.140	1.200	2.100

Panel B: Correlation Matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
TCB(ln) [1]	1.00*																
Maturity [2]	0.2182*	1.00*															
Facility amount(ln) [3]	-0.3232*	-0.0051	1.00*														
Previous relation [4]	-0.1121*	0.0074	0.3375*	1.00*													
Syndicate size [5]	-0.1102*	0.0418*	0.4305*	0.2846*	1.00*												
Total assets (ln) [6]	-0.2691*	-0.1684*	0.6154*	0.3572*	0.2681*	1.00*											
Profitability [7]	-0.0627*	0.0078	0.1487*	0.0185	0.0278	0.0996*	1.00*										
Leverage [8]	0.1868*	-0.0084	0.0318*	0.1084*	0.1022*	0.1702*	-0.0918*	1.00*									
MTB [9]	-0.3207*	-0.0920*	0.1210*	-0.0179	-0.0183	-0.0261	0.2115*	-0.1994*	1.00*								
Tangibility [10]	-0.0006	-0.0629*	0.0023	-0.0246	0.0122	0.0852*	0.3709*	0.1096*	-0.1776*	1.00*							
Z-score [11]	-0.3322*	-0.0630*	-0.0892*	-0.0623*	-0.1298*	-0.1128*	-0.3177*	-0.3171*	0.2738*	-0.2248*	1.00*						
Institutional Ownership [12]	0.1262*	0.2334*	-0.0176	0.0928*	0.0187	-0.1837*	0.0012	-0.1474*	-0.0449*	-0.2403*	-0.0927*	1.00*					
Block Ownership [13]	0.1769*	0.1173*	-0.1189*	-0.0457*	-0.0350*	-0.2033*	-0.1000*	0.0172	-0.1308*	-0.1072*	-0.0833*	0.5223*	1.00*				
Insider Ownership [14]	0.0786*	0.0707*	-0.0449*	-0.0379*	-0.0189	-0.1282*	0.0111	-0.0047	0.0147	0.0193	0.0492	-0.0861*	0.0403*	1.00*			
Board Independence [15]	-0.1187*	-0.0740*	0.0763*	0.0434*	-0.0391*	0.1814*	0.0012	0.0378*	-0.0820*	-0.0095	0.0227	0.1050*	-0.0433*	-0.2305*	1.00*		
Board Duality [16]	-0.1734*	-0.1921*	-0.0847*	-0.1213*	0.0662*	-0.0368*	-0.0187	0.1211*	0.0873*	0.0716*	0.0101	-0.2830*	-0.0708*	0.0332*	-0.1368*	1.00*	
Board Size [17]	-0.2955*	-0.2292*	0.2434*	0.0694*	0.1621*	0.3956*	0.0305	0.1425*	0.0753*	0.1140*	-0.0463	-0.2974*	-0.1550*	-0.0162	-0.1368*	0.4081*	1.00*

Table 3

Institutional Ownership Deciles and the average Total Cost of Borrowing

	Decile	Average TCB
Low Institutional Concentration	1	4.089
	2	3.992
	3	3.949
	4	3.935
	5	3.872
	6	4.043
	7	4.041
	8	4.125
	9	4.304
High Institutional Concentration	10	4.516

Table 4

Main Regression Analysis

Table 4 presents the findings on pooled OLS regressions exploring the effect of corporate governance on the total cost of borrowing. The dependent variable (TCB) is measured as the natural logarithm of the total cost of borrowing. Institutional ownership measures the percentage of equity holdings held by investors that own more than $100 million. Insider onwership measures the fraction of equity held by insiders of a company. Board size reflects the number of directors serving on the board. Board independence is the number of outside directors as scaled by board size. Board duality is an indicator variable that takes the value of one if the CEO is also chairman of the board. Other independent variables are included as mentioned in Section 3 of the paper. All regression include year effects and industry effects (at 2-digit SIC) and indicators for loan purpose and loan type. Model (1)-(3) explore the impact of institutional ownership, insider ownership and board structure respectively. Model (4) reports estimates of all these mechanisms jointly in one regression model. Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm. They are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses.

***Significance at 1%, ** Significance at 5%, *Significance at 10%

	1	2	3	4
VARIABLES	TCB	TCB	TCB	TCB
Institutional ownership	-1.459*			-1.342*
	(-0.78)			(-0.774)
Institutionalownership^2	1.092**			1.020*
	(-0.544)			(-0.543)
Insider ownership		1.131**		1.005*
		(-0.56)		(-0.556)
Board size			-0.0139*	-0.0131*
			(-0.00721)	(-0.00721)
Board duality			0.1931	0.144
			(-0.1175)	(-0.115)
Board independence			-0.034	-0.033
			(-0.113)	(-0.111)
Total assets (ln)	-0.0737***	-0.0798***	-0.0705***	-0.0633***
	(-0.0227)	(-0.0229)	(-0.023)	(-0.0227)
Maturity	-	-	-	-
	0.00952***	0.00964***	0.00964***	0.00961***
	(-0.00186)	(-0.00185)	(-0.00187)	(-0.00185)
Facility amount	-0.0384	-0.038	-0.0375	-0.0377
	(-0.0246)	(-0.0245)	(-0.0244)	(-0.0246)
MTB	-0.0984***	-0.0949***	-0.0922***	-0.0940***
	(-0.0176)	(-0.0173)	(-0.017)	(-0.0175)
Leverage accounting	0.628***	0.634***	0.626***	0.643***
	(-0.135)	(-0.136)	(-0.138)	(-0.138)
Profitability	0.305**	0.290*	0.292**	0.306**
	(-0.15)	(-0.148)	(-0.144)	(-0.147)
z_score	-0.215***	-0.223***	-0.225***	-0.221***
	(-0.0386)	(-0.0388)	(-0.0387)	(-0.0385)
Tangibility	0.0414	0.0541	0.051	0.0445
	(-0.0992)	(-0.0967)	(-0.0972)	(-0.098)
Previous relations	-0.00275	-0.0028	-0.00279	-0.00295
	(-0.00306)	(-0.003)	(-0.00302)	(-0.00305)
Syndicate size	-0.00254*	-0.00231	-0.00227	-0.00242*
	(-0.00145)	(-0.00147)	(-0.00146)	(-0.00144)
IG	-0.513***	-0.515***	-0.511***	-0.506***
	(-0.0436)	(-0.043)	(-0.0445)	(-0.045)
364-day revolving facility	0.857***	0.857***	0.856***	0.858***
	(-0.256)	(-0.255)	(-0.256)	(-0.256)
Term Loan	0.347	0.343	0.351	0.346
	(-0.248)	(-0.248)	(-0.249)	(-0.249)

Revolver	-0.743	-0.753	-0.743	-0.744
	(-0.25)	(-0.25)	(-0.251)	(-0.25)
Institutional Term Loan	0.649	0.641	0.656	0.653
	(-0.257)	(-0.257)	(-0.258)	(-0.257)
Acquisition line	-0.17	-0.162	-0.156	-0.176
	(-0.17)	(-0.168)	(-0.166)	(-0.175)
LBO/MBO	0.449**	0.485**	0.494**	0.421**
	(-0.198)	(-0.198)	(-0.192)	(-0.198)
Corporate Purpose	-0.406***	-0.394**	-0.388**	-0.414***
	(-0.156)	(-0.156)	(-0.152)	(-0.159)
Working Capital	-0.451***	-0.445***	-0.444***	-0.455***
	(-0.155)	(-0.156)	(-0.151)	(-0.157)
Debt Repay.	-0.465***	-0.467***	-0.457***	-0.473***
	(-0.172)	(-0.174)	(-0.17)	(-0.175)
Constant	7.256***	6.793***	6.707***	7.100***
	(-0.621)	(-0.52)	(-0.52)	(-0.631)
Observations	965	967	967	965
Nr.borrowers	408	408	409	408
R-squared	0.845	0.845	0.845	0.846
Year Effects	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES
Loan Purpose Effects	YES	YES	YES	YES
Loan Type Effects	YES	YES	YES	YES

Table 5
The leverage channel

Table 5 presents the effect of governance mechanisms for different levels of firm leverage. It shows OLS estimates for the main pricing model and the interactions of institutional ownership, insider ownership and board structures with firms' financial leverage. The variable highleverage represents firms belonging in the highest tercile of financial leverage. The variable lowleverage represents firms belonging in the lowest tercile of financial leverage. The dependent variable (TCB) is measured as the natural logarithm of the total cost of borrowing. Institutional ownership measures the percentage of equity holdings held by investors that own more than $100 million. Insider onwership measures the fraction of equity held by insiders of a company. Board size reflects the number of directors serving on the board. Board independence is the number of outside directors as scaled by board size. Board duality is an indicator variable that takes the value of one if the CEO is also chairman of the board. Other independent variables are included as mentioned in Section 3 of the paper. All regression include year effects, industry effects (at 2-digit SIC) and indicators for loan purpose and loan type. Model (1)-(3) explore the impact of institutional ownership, insider ownership and board structure respectively. Model (4) reports estimates of all these mechanisms jointly in one regression model. Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm. They are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses.

***Significance at 1%, ** Significance at 5%, *Significance at 10%

	1	2	3	4
VARIABLES	TCB	TCB	TCB	TCB
Institutional ownership	-1.794**			-1.593**
	(-0.818)			(-0.798)
Institutional ownership^2	1.354**			1.277**
	(-0.571)			(-0.559)
Institutional ownership*highlev	0.0302			-0.139
	(-0.0742)			(-0.228)
Institutional ownership*lowlev	0.110*			0.0342
	(-0.0589)			(-0.105)
High Leverage	0.2484			
	(0.248)			
Low Leverage	-0.0565			
	(0.173)			
Insider ownership		-0.519		0.693
		(-0.943)		(-1.051)
Insider ownership*lowleverage		1.199		-0.544
		(-1.071)		(-1.149)
Insider ownership*highleverage		8.575**		7.245*
		(-3.949)		(-4.241)
Board size	-0.0246***	-0.0228**		
	(-0.00804)	(-0.009)		
Board independence	-0.0493	-0.09		
	(-0.116)	(-0.114)		
Board duality			0.168	0.137
			(-0.115)	(-0.116)
Board size*highleverage			0.011	0.00832
			(-0.0145)	(-0.0137)
Board size*lowleverage			0.00663	0.0058
			(-0.00442)	(-0.00774)
Board independence*highleverage			-0.0864	0.0428
			(-0.176)	(-0.266)
Board independence*lowleverage			0.00667	0.0051
			(-0.00472)	(-0.00773)
Constant	7.487***	7.091***	7.032***	7.301***
	(-0.616)	(-0.505)	(-0.483)	(-0.619)
Observations	965	967	967	965
Nr.borrowers	408	408	409	409
R-squared	0.843	0.842	0.843	0.847

Year Effects	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES
Loan Purpose Effects	YES	YES	YES	YES
Loan Type Effects	YES	YES	YES	YES

Table 6
The moderating role of Entrenchment Index

Table 6 presents estimates on the effect of the market for corporate control in shaping the relation between governance and the total cost of borrowing. It shows OLS estimates for the main pricing model and the interactions of institutional ownership, insider ownership and board structures with the Entrenchment Index(EI) Construction of the Index is explained in the main analysis of the paper. The governance variables are interacted with EI accordingly. The dependent variable (TCB) is measured as the natural logarithm of the total cost of borrowing. Institutional ownership measures the percentage of equity holdings held by investors that own more than $100 million. Insider onwership measures the fraction of equity held by insiders of a company. Board size reflects the number of directors serving on the board. Board independence is the number of outside directors as scaled by board size. Board duality is an indicator variable that takes the value of one if the CEO is also chairman of the board. Other independent variables are included as included as in Table 4, with one exception. I use leverage instead of leverage_accounting when reporting the estimates. For clarity and simplicity, the table reports only the variables of interest. All regression include year effects, industry effects (at 2-digit SIC) and indicators for loan purpose and loan type. Model (1)-(3) explore the impact of institutional ownership, insider ownership , board structure and their respective interaction terms on the TCB. Model (4) reports estimates of all these mechanisms jointly in one regression model. Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm. They are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses.

***Significance at 1%, ** Significance at 5%, *Significance at 10%

	1	2	3	4
VARIABLES	TCB	TCB	TCB	TCB
Institutional ownership	-2.008			-1.464
	(-1.227)			
Institutional ownership2	1.589*			1.253
	(-0.905)			(-1.009)
Entrenchment index(EI)	-0.118	-0.00954	0.0277	0.00985
	(-0.169)	(-0.0158)	(-0.0618)	(-0.184)
EI*institutional ownership	0.321			0.136
	(-0.474)			(-0.503)
EI*institutional ownership2	-0.239			-0.115
	(-0.327)			(-0.349)
Insider ownership		3.279**		2.513**
		(-1.279)		(-1.097)
EI*insider ownership		-1.125***		-1.110***
		(-0.288)		(-0.303)
Board size			-0.0204	-0.016
			(-0.0133)	(-0.0143)
Board independence			0.316	0.343*
			(-0.194)	(-0.2)
Board duality			0.134	0.0526
			(-0.116)	(-0.133)
EI*board independence			-0.0717	-0.0867
			(-0.0728)	(-0.0725)
EI*board size			0.00282	0.00229
			(-0.00404)	(-0.00431)
Constant	7.427***	6.875***	6.684***	6.984***
	(-0.75)	(-0.54)	(-0.503)	(-0.718)
Observations	955	952	950	945
Nr.borrowers	279	279	280	279
R-squared	0.847	0.848	0.849	0.852
Industry Effects	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES
Firm-specific Characteristics	YES	YES	YES	YES
Loan-specific characteristics	YES	YES	YES	YES
Loan Purpose Effects	YES	YES	YES	YES
Loan Type Effects	YES	YES	YES	YES

Table 7

Governance and Nonprice Terms of Loans

Table 7 presents estimates of logit regresssion. Prepayment Covenant is a binary variable indicating the presence of a prepayment covenant in the loan contracts. Financial Covenant is a binary variable indicating the existence of financial covenants in a loan contract. Collateral is a binary variable indicating whether the loan is secured or not. Models (1)-(3) report the average marginal effects of each coefficient on the probability of a loan including prepayment covenants, financial covenants and collateral, respectively. Control variables are included as in the main regression analysis and reported in Appendix. Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm. They are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses. ***Significance at 1%, ** Significance at 5%, *Significance at 10%

	1	2	3
VARIABLES	Prepayment Covenant	Financial Covenant	Collateral
Institutional ownership	0.156*	-0.249*	0.196
	(-0.0915)	(-0.14)	(-0.154)
Insider ownership	-1.762	-2.277	-1.604
	(-1.227)	(-1.491)	(-1.887)
Board size	-0.00903*	-0.00253	-0.0147*
	(-0.00486)	(-0.00799)	(-0.00811)
Board indepenence	-0.0812	-0.000853	-0.421***
	(-0.0719)	(-0.126)	(-0.127)
Board duality	1.107	-2.29	1.275
	(-97.19)	(-94.8)	(-60.35)
Maturity	-0.00203***	-0.000687	0.00165
	(-0.000697)	(-0.00127)	(-0.00113)
Facility amount	0.00504	-0.0223	-0.0196
	(-0.013)	(-0.023)	(-0.023)
Total assets (ln)	-0.00506	-0.0839***	-0.00137
	(-0.0153)	(-0.023)	(-0.0241)
Previous relations	-0.00359*	0.00732**	-0.00713**
	(-0.00204)	(-0.00306)	(-0.0032)
Syndicate size	0.00221**	0.00531***	-0.0015
	(-0.00104)	(-0.00193)	(-0.00207)
MTB	-0.000475	-0.0287	-0.00523
	(-0.0161)	(-0.024)	(-0.0252)
Leverage	0.142*	0.031	0.435***
	(-0.0842)	(-0.135)	(-0.135)
Profitability	0.0701	0.0395	-0.412***
	(-0.0904)	(-0.147)	(-0.144)
z-score	0.0638**	-0.0166	-0.164***
	(-0.0273)	(-0.0388)	(-0.0376)
Tangibility	-0.0298	0.0366	0.034
	(-0.0615)	(-0.0913)	(-0.0946)
IG	-0.147***	-0.0730*	-0.263***
	(-0.0268)	(-0.0389)	(-0.0347)
Observations	940	804	519
Nr.borrowers	296	296	228
Pseudo R-square	0.391	0.196	0.450

Year Effects	YES	YES	YES
Industry Effects	YES	YES	YES
Loan Purpose Effects	YES	YES	YES
Loan Type Effects	YES	YES	YES

Table 8

Simultaneity among price and non-price terms of loans

Table 8 presents results of the second stage of the structural model to check for joint determination between the total cost of borrowing, covenants and collateral. TCB is the natural logarithm of the total cost of borrowing. Collateral-Fitted values is a variable indicating the fitted values of the reduced-form regression on collateral. Covenant-Fitted values is a variable indicating the fitted values of the reduced-form regression on covenant (dummy covenant in the reduced form regressions represents either a prepayment or a financial covenant). Credit spread is the difference between AAA and BAA corporate bond yields. Term spread is the difference between 10Year and 2Year Treasury yield. Other control variables are included as in the main regression analysis and reported in the Appendix. Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm. They are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses. ***Significance at 1%, ** Significance at 5%, *Significance at 10%

VARIABLES	TCB
Collateral-Fitted values	0.334***
	(-0.125)
Covenant-Fitted values	0.457**
	(-0.208)
Institutional ownership	-2.864**
	(-1.245)
Institutional ownership2	2.011**
	(-0.844)
Insider ownership	0.906
	(-0.83)
Board size	0.00286
	(-0.00684)
Board duality	-0.148***
	(-0.0436)
Board independence	0.247**
	(-0.107)
Maturity	-0.0092***
	(-0.00113)
Facility amount	-0.0351*
	(-0.0197)
Previous relation	-0.00601**
	(-0.00291)
Syndicate size	-0.00408**
	(-0.00204)
Total assets	-0.0175
	(-0.0226)
MTB	-0.0992***
	(-0.0156)
Leverage	0.628***
	(-0.121)
Profitability	0.234**
	(-0.116)
z-score	-0.175***
	(-0.0357)
Tangibility	0.0923
	(-0.0719)
IG	-0.276***
	(-0.066)

Credit spread	0.145***
	-0.0357
Term spread	0.116***
	-0.0151
Constant	5.920***
	(-0.536)
Observations	890
Nr.borrowers	393
R-squared	0.807
Year Effects	NO
Industry Effects	YES
Loan Purpose Effects	YES
Loan Type Effects	YES

Table 9

Alternative Proxies for Institutional Ownership and Board Size

Table 9 presents estimates using different proxies for institutional ownership and board size. Model (1) presents estimates using blockholder ownership as a measure of institutional ownership concentration. Model (2) presents estimates using board size scaled by total assets as a measure of board size. The dependent variable is the natural logarithm of the total cost of borrowing. Control variables are included in the regression as presented in the Appendix. The regression includes year effects, industry effects (at 2-digit SIC) and indicators for loan purpose and loan type. Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm. They are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses. ***Significance at 1%, ** Significance at 5%, *Significance at 10%

	1	2
VARIABLES	TCB	TCB
Block ownership	-0.736*	
	(-0.431)	
Block ownership^2	2.067***	
	(-0.771)	
Institutional ownership		-1.344*
		(-0.777)
Institutional ownership^2		1.021*
		(-0.544)
Insider ownership	0.355	1.031*
	(-0.515)	(-0.558)
Board size/Total assets		-0.0945
		(-0.0617)
Board size	-0.0115	
	(-0.00823)	
Board duality	0.107	0.143
	(-0.12)	(-0.118)
Board independence	-0.0272	-0.0296
	(-0.125)	(-0.111)
Maturity	-0.00808***	-0.00962***
	(-0.0014)	(-0.00186)
Facility amount(ln)	-0.0450*	-0.0376
	(-0.0234)	(-0.0246)
MTB	-0.133***	-0.0953***
	(-0.0253)	(-0.0175)
Total assets(ln)	-0.0654**	-0.0769***
	(-0.0254)	(-0.0226)
Leverage-accounting	0.696***	0.646***
	(-0.148)	(-0.138)
Profitability	0.424***	0.311**
	(-0.157)	(-0.148)
z-score	-0.205***	-0.220***
	(-0.0421)	(-0.0384)
tangibility	0.0921	0.0413
	(-0.0946)	(-0.0985)
Previous relations	-0.00393	-0.00289
	(-0.0031)	(-0.00306

Syndicate size	-0.00211	-0.00246*
	(-0.00154)	(-0.00145)
IG	-0.489***	-0.505***
	(-0.0464)	(-0.045)
Constant	7.128***	7.188***
	(-0.478)	(-0.627)
Observations	804	965
Nr.borrowers	270	408
R-squared	0.851	0.846
Year Effects	YES	YES
Industry Effects	YES	YES
Loan Purpose Effects	YES	YES
Loan Type Effects	YES	YES

Table 10
Robustness checks

Table 10 presents estimates from various robustness tests. Model (1) shows results of the second stage of the 2SLS regression using asset maturity as an instrumental variable for loan maturity. Asset maturity is calculated as :

$$[PPE/(CurrentAssets + PPE)] * [PPE/Depreciation] + [CurrentAssets/(CurrentAssets + PPE)] * [CurrentAssets/COGS].$$

Model (2) displays estimates of the median regression to ensure that outliers do not drive my results. Model (3) displays estimates of firm and year fixed effect model. Model (4) displays estimates using the weighted average of loan terms (by facility amount) to determine the cost of borrowing. The dependent variable is the natural logarithm of the total cost of borrowing. Control variables are included in the regression as presented in the Appendix. The regressions includes year effects, industry effects (at 2-digit SIC) and indicators for loan purpose and loan type, except for Model (4). Standard errors are clustered at a firm level to control for co-dependence between facilities issued to the same firm except for Model (3). Standard errors are robust to heteroskedasticity. Absolute values of t-statistics are reported in parantheses. ***Significance at 1%, ** Significance at 5%, *Significance at 10%

	2SLS (IV for maturity)	Median regression	Firm-Year FE	Weighted average
VARIABLES	TCB	TCB	TCB	TCB
Institutional ownership	-1.606*	-0.533	-0.852	-1.5405
	(-0.858)	(-0.572)	(-1.207)	(-3.107)
Institutional ownership^2	1.262**	0.453	0.522	0.7918
	(-0.611)	(-0.391)	(-0.806)	(-2.128)
Insider ownership	0.135	0.622***	1.343*	4.3659
	(-0.614)	(-0.179)	(-0.813)	(-3.306)
Board size	0.266**	-0.00901*	-0.0192**	-0.0216**
	(-0.128)	(-0.00468)	(-0.00959)	(-0.0103)
Board duality	-0.00673	0.0358	0.331	1.529***
	(-0.00913)	(-0.286)	(-0.357)	(-0.4396)
Board indepenence	-0.0794	0.0467	-0.0428	-0.0009
	(-0.13)	(-0.0713)	(-0.135)	(-0.3389)
Maturity	-0.000298	-0.0103***	-0.00919***	0.093***
	(-0.00702)	(-0.00102)	(-0.000913)	(-0.0001)
Facility amount (ln)	-0.0394	0.0001	0.00236	-0.526***
	(-0.0275)	(-0.0172)	(-0.0192)	(-0.122)
Previous relations	-0.00378	0.00184	-0.0195***	-0.0147
	(-0.00369)	(-0.00156)	(-0.00431)	(-0.0104)
Syndicate size	-0.00248	-0.00135	-0.00440***	-0.0167***
	(-0.00167)	(-0.00106)	(-0.00144)	(-0.00463)
Total assets	-0.0560**	-0.110***	-0.107**	0.505***
	(-0.0275)	(-0.0152)	(-0.049)	(-0.0978)
Leverage accounting	0.694***	0.331***	0.762***	0.857*
	(-0.166)	(-0.0788)	(-0.183)	(-0.5037)
MTB	-0.104***	-0.0211	-0.117***	-0.04537
	(-0.019)	(-0.015)	(-0.0232)	(-0.0813)
Profitability	0.103	0.339***	0.00449	-0.387**
	(-0.163)	(-0.0969)	(-0.214)	(-0.6151)
z_score	-0.237***	-0.221***	-0.215***	-0.439***
	(-0.0511)	(-0.0233)	(-0.059)	(-0.1402)
Tangibility	0.00518	0.125**	-0.315	-0.872**
	(-0.103)	(-0.0631)	(-0.276)	(-0.3814)
IG	-0.448***	-0.529***	-0.313***	-0.0926
	(-0.0528)	(-0.0283)	(-0.0582)	(-0.1451)
Constant	6.325***	6.444***	6.233***	5.8179**
	(-0.853)	(-0.509)	(-0.785)	(-0.011)

Observations	909	965	965	703
Nr.borrowing firms	294	298	298	297
R-squared	0.834	0.651	0.932	0.989
Year Effects	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES
Loan Purpose Effects	YES	YES	YES	NO
Loan Type Effects	YES	YES	YES	NO

9.2 Appendix B: List of Figures

Notes: Figure 1 depicts graphically the distribution of loan volume across the years in my sample. The blue fraction represents investment-grade loans and the red fraction represents non-investment grade loans. In 2012, there are only six facilities in my sample.

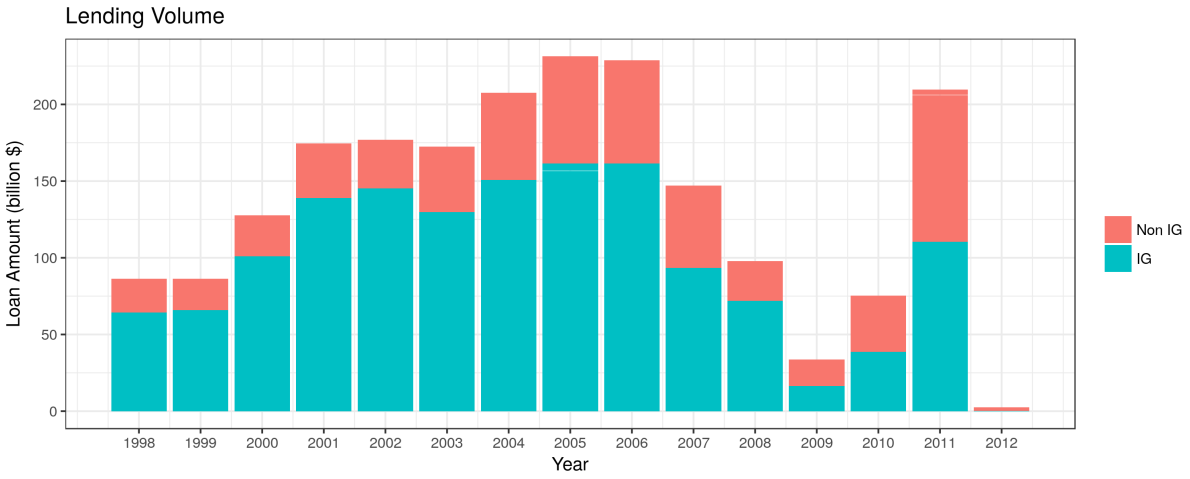

Figure 1: Distribution of loans

Notes: Figure 2 depicts graphically the univariate relationship between institutionall ownership and the total cost of borrowing. The x-axis represents institutional ownership as divided into deciles (0-10). The y-axis represents the average TCB for every decile of ownership.

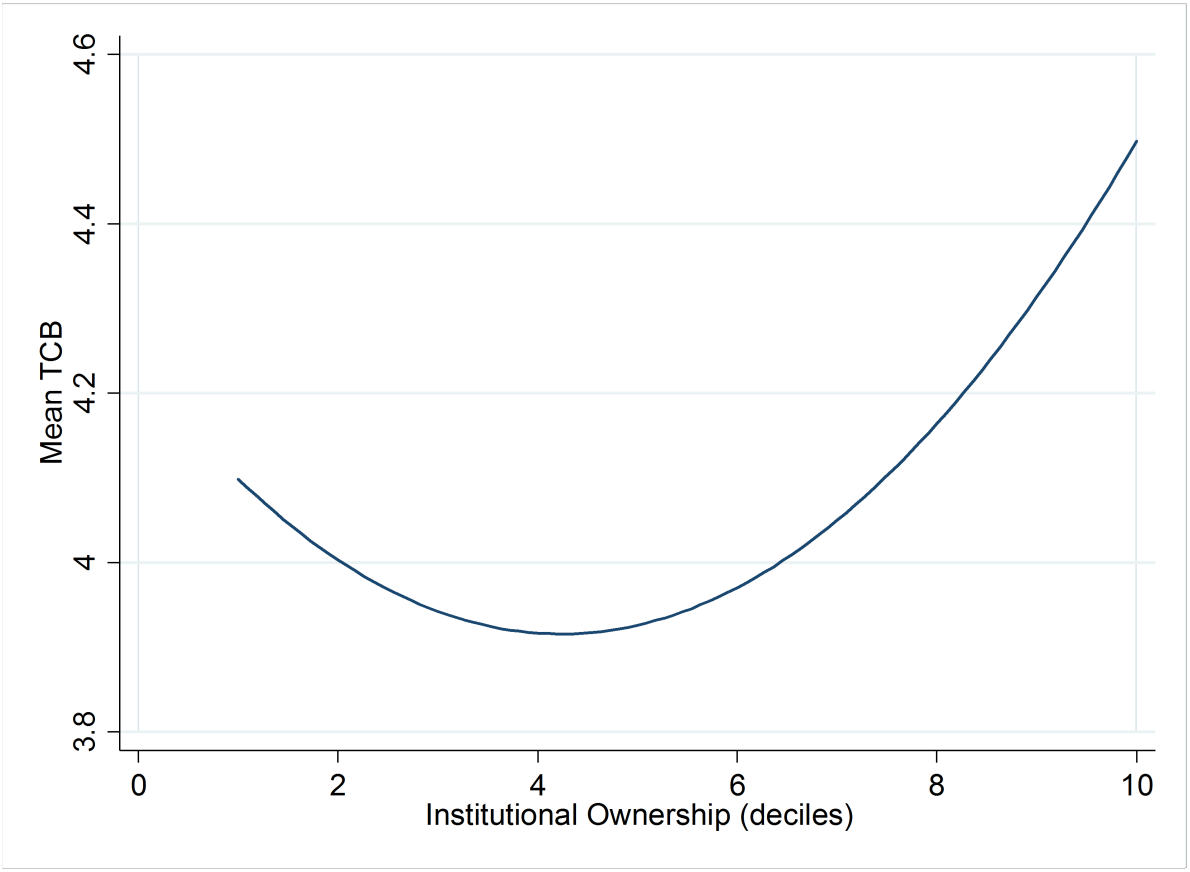

Figure 2: Mean TCB and Institutional Ownership Deciles

Notes : Figure 3 displays graphically the relationship between institutional ownership and the total cost of borrowing using the coefficients of Model (1) in Table 4. The x-axis represents the level of ownership concentration and the y-axis represents the total cost of borrowing in basis points.

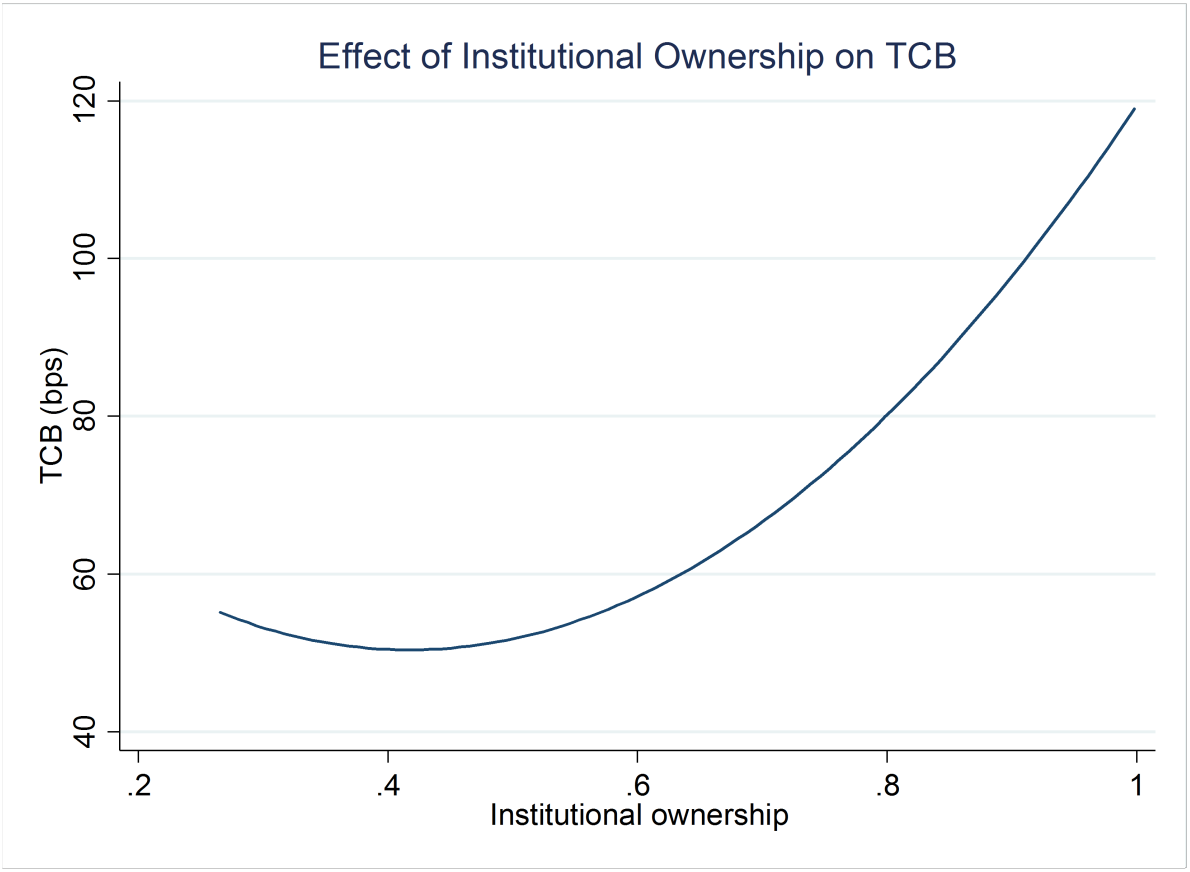

Figure 3: Effect of Institutional Ownership on TCB

9.3 Appendix C: Variable Definition

Variable	Definition	Source
TCB	Natural logarithm of the total cost of borrowing	Berg.et al
Institutional ownership	The fraction of institutional holdings on the month-end of every quarter preceding the origination of the loan; calculated in decimals	Thompson Institutional (13f) Holdings - WRDS
Block ownership	Fraction of block holdings (>5%) on the month-end of every quarter preceding the origination of the loan; calculated in decimals	Thompson Institutional (13f) Holdings - WRDS
Insider ownership	Fraction of shares held by insiders in the quarter prior to loan origination; calculated in decimals	Thompson Reuters Insiders- WRDS
Board size	The number of directors serving on board	Institutional Shareholder Services (ISS) - WRDS
Board independence	The percentage of independent directors on board	Institutional Shareholder Services (ISS) - WRDS
Board duality	Indicator equals one if CEO serves also as chairman	Institutional Shareholder Services (ISS) - WRDS
Total assets	Natural logarithm of total assets	Compustat
MTB	Ratio of Market value to Total Assets where; $Marketvalue = MV(equity) - BV(equity) + tot.assets$ $MV(equity) = prccq * cshoq$ $BV(equity) = tot.assets - ltq - txditcq$	Compustat
Leverage	Ratio of Total Debt to Total assets where; $TotalDebt = dltcq + dlttq$	Compustat
Leverage accounting	Ratio of Total Liabilities to Total Assets	Compustat
Profitability	EBITDA/Sales where; $EBITDA = saleq - cogsq - xsgaq$	Compustat
Tangibility	Ratio of physical plant, property, and equipment to total assets; ppentq/atq	Compustat

Altman's z-score	Defined according to Altman (1968) as: $(3.3 * EBIT + 0.999 * saleq + 1.4 * req + 1.2 * wcapq)/atq$	Compustat
Maturity	Maturity of a facility in months	Dealscan
Facility amount (ln)	Natural logarithm of the facility amount	Dealscan
Syndicate size	Number of lenders in a syndicate	Dealscan
Prior relations	Past commercial relations between the same borrower and the same lender	Dealscan
Prepayment Covenant	Indicator variable equal to one if the loan contains a prepayment covenant in the form of sweeps	Dealscan
Collateral	Indicator variable equal to one if the loan is secured	Dealscan
IG	Indicator variable that equals one if the firm is rated as investment grade (ratings higher than BBB- based on the S&P ratings)	Compustat
Credit spread	Difference between BAA and AAA corporate bond yields	Federal Reserve
Term spread	Difference between 10Y and 2Y Treasury yields	Federal Reserve
Asset maturity	Defined in Graham et al.(2007) as$[PPE/(CurrentAssets + PPE)] * [PPE/Depreciation] + [CurrentAssets/(CurrentAssets + PPE)] * [CurrentAssets/COGS]$ Twhere COGS is cost of goods sold	Compustat

9.4 Appendix D: The Total Cost of Borrowing

The measure developed by Berg et al. (2016) aims at better capturing the borrowing costs by relying not only on the spread, but also on various fees in a loan contract. The authors make a case that the measure can be used to assess the likelihood of borrowers exercising certain options ingrained in the contract terms. In specific, it takes into account four fees most abundantly found in loan contracts: the facility fee, the cancellation fee, the utilization fee and the upfront fee. The measure takes the form :

$$
\begin{aligned}
TCB = {} & Upfront\ Fee/Expected\ Loan\ Maturity\ in\ Years && (1)\\
& + (1 - PDD) * (Facility\ Fee + Commitment\ Fee) && (2)\\
& + PDD * (Facility\ Fee + Spread) && (3)\\
& + PDD * Prob(Utilization > UtilizationThreshhold | Usage > 0) * Utilization\ Fee && (4)\\
& + Prob(Cancellation) * Cancellation\ Fee && (5)
\end{aligned}
$$

Where the sum of Facility Fee and Commitment Fee yields the all-in-undrawn-spread in Dealscan , whereas the sum of Facility Fee and Spread yields the all-in-drawn-spread in Dealscan. PDD is the probability that the loan amount is drawn down. PDD is set to 100% for term loans since the amount is funded at origination. To calculate the PDD of credit lines, the authors provide a thorough model in their Internet Appendix of the paper.

Term (4) of the equation is the utilization fee of a credit line a borrower has to pay if it utilizes more than a given threshold of the credit limit.

Term (5) takes into account the probability of cancellation and is set by the authors arbitrarily at 50%.