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INVESTOR SENTIMENT AND DEBT CONTRACTING

By

Rohit Agarwal

A DISSERTATION

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Investor Sentiment And Debt Contracting

Abstract

This study examines the impact of investor sentiment on loan spread and financial covenants in debt contracts. Periods of high investor sentiment generally result in pressure on loan spreads due to the ability to issue equity at lower cost. Thus, I conjecture that managers of borrowing firms as well as lenders may trade-off lower spreads against higher or more restrictive covenants during such periods. Therefore, high investor sentiment has two related effects on debt covenants: (i) it encourages higher and more restrictive covenants by lenders at contract inception and, consequently, (ii) it ensures a higher ex-ante probability of eventual covenant violations. Consistent with the conjectures, I find that investor sentiment is positively associated with the intensity and restrictiveness of financial covenants and negatively associated with spreads. Specifically, high investor sentiment periods are associated with higher covenants (performance covenants, capital covenants and covenants intensity) and lower spreads. Further analysis indicates that this relationship is more pronounced for financially constrained firms and for firms that exhibit a lower degree of timely loss recognition in accounting earnings. Additionally, I find that investor sentiment is positively associated with the ex-ante likelihood of covenant violations. Collectively, these findings highlight the importance of the role played by investor sentiment in debt contracting.

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CHAPTER 1: INTRODUCTION

Lenders negotiate loan terms with borrowers such that the loan is appropriately priced given the risk assumed by the lender and the monitoring processes agreed to by the borrower and lender as part of the loan agreement. Loan terms and monitoring processes may be influenced by the macro-economic forces in play at the time the agreement is initiated. One of the significant macro-economic forces that I examine in this paper is investor sentiment. Specifically, I examine the effect of investor sentiment on the interest rate and covenants, generally considered the most significant loan term and monitoring mechanisms, as well as the trade-off between these two loan characteristics. Lending institutions assume risk by issuing loans (debt) to borrowers and they develop expertise in monitoring the financial activities of the borrower to mitigate the risk they have assumed. Since asymmetric information between lenders and borrowers is pervasive and borrowing institutions could inherently have agency issues, the lending institutions need to put in place control mechanisms to mitigate the impact of this asymmetric information problem coupled with agency costs of debt. One such mechanism is the use of covenants in loan contracts. Covenants play an important role in mitigating these information asymmetry and agency problems in debt contracting (Jensen and Meckling 1976; Myers 1977; Smith and Warner 1979; De Long et al. 1990; Morck, Shleifer, and Vishny 1990; Smith 1993; Dewatripont and Tirole 1994; Tirole 2006).

Information asymmetry and the conflicts of interest between security issuers and capital providers entails significant information and agency risks for capital providers (Beatty and Ritter 1986). In the context of debt contracting, these risks are manifested in a variety of moral hazard problems such as asset substitution and claim dilution (Bebchuk 2002). The purpose of debt covenants is to give lenders an early warning signal about the financial distress of the borrowers

and to have the timely transfer of decision rights to the lenders. In essence, covenants are tools used in loan contracts to assist lenders in monitoring the borrower and play an important role in mitigating information asymmetry in debt contracting (Chava and Roberts 2008). These loan covenants that are incorporated by lending institutions could affect firm efficiency of the borrowing entity and eventually affect its value. Evidence suggests that these covenants could have either a positive or a negative impact on the firm's overall value (Gigler et al. 2009; Li 2013; Frankel et al. 2008)

Borrowers, on the other hand, would not want to accept too many covenants because intensive and strict covenants could be costly for borrowing firms as their violation triggers a negative stock market reaction as well as significant refinancing and restructuring costs (Beneish and Press 1995). For example, Beneish and Press (1993) report that violations trigger refinancing costs of about 1 percent and restructuring costs of about 0.4 percent of a firm’s total assets. Given the incentives of the contracting parties, an optimal debt contract is the result of the bargaining process between the lenders and the borrowers where they want to maximize their payoffs.

In this paper, I examine how investor sentiment at the time of contract initiation affects this bargaining process. Investor sentiment is mostly defined as a phenomenon in which investor beliefs about future firm value significantly deviate from fundamental information (De Long et al. 1990; Morck, Shleifer, and Vishny 1990; Baker and Wurgler 2006, 2007). More broadly, investor sentiment means there is optimism or pessimism about stocks in general and the investors’ perception of future cash flows is significantly different from firm fundamentals. Moreover, investor sentiment can lead to firm-level mispricing that persists over long periods of time (De Long et al. 1990; Shleifer and Vishny 1997; Brown and Cliff 2005; Baker and Wurgler 2006, 2007).

Moreover, there is research that has been done on the rational and irrational factors that affect firm value and found that investor sentiment affects firm value through various channels. Prior research finds evidence that investor sentiment affects corporate disclosure policies (Bergman and Roychowdhury 2008), analysts' earnings forecast errors (Hribar and McInnis 2012; Walther and Willis 2013), stock market response to earnings news (Mian and Sankaraguruswamy 2012), general corporate investment (Arif and Lee 2014), external financing costs (McLean and Zhao 2014), bidder announcement abnormal returns (Danbolt et al. 2015), and R&D investment (Dang and Xu 2018). Investor sentiment is significantly associated with various corporate, financing and investment decisions. Despite all this work on investor sentiment, there is scant empirical evidence on the influence of investor sentiment on the interplay between covenants and interest rates in corporate borrowings.

I extend this mis-valuation argument of Baker and Wurgler (2007) to the setting of debt contract design. My paper fills this gap by examining whether high investor exuberance in the market increases lender's demand for covenants serving as "trip wires" in debt contracting and consequently, increase the likelihood of subsequent covenant violations. Specifically, I examine the impact of investor sentiment on borrowing firm's ex-ante covenant intensity and ex-ante likelihood of covenant violations.

During high sentiment periods, there is ample liquidity available in the market and lenders face competition from equity market and corporate bond markets. This puts a lot of pressure on their margins (loan spreads). Cubillas and Suarez (2021) provide international evidence that bank stability is reduced during periods of high sentiment. Given that the ability of lenders to price-protect themselves with loan spreads is impaired in periods of high sentiment, they will need alternative mechanisms to create opportunities to renegotiate if the optimistic projections are not

realized. One mechanism that can be used in this setting is for lenders to protect themselves by using more stringent covenants in the debt contract design. In other words, if the lenders cannot price-protect themselves they will want to have more covenants so that there is a transfer of decision rights to lenders in case of violation. Also, increasing the intensity and tightness of the covenants gives lenders an opportunity to reset the interest spreads when sentiment reverses. The lenders' information set can help them mitigate some of the risks from overstated asset values in the balance sheet and earnings in income statement during excessive investor exuberance.

Borrowers, on the other hand, in the periods of high sentiment will want a lower spread and higher covenants. Dang and Xu (2018) find that broader market exuberance spills over to high managerial sentiment. Thus, when sentiment is high, managerial optimism is also high and managers underestimate the probability of breaching the debt covenants. And this raises the ex-ante likelihood of managers' accepting higher covenants and lower spread in the debt contract design.

Under optimal contract design, during high sentiment periods, both borrowers and lenders will choose a debt contract with a lower spread and higher covenants. Concretely, through this study, I test the hypotheses that loans made during high (low) investor sentiment periods carry tighter (looser) covenants, ceteris paribus, and, that the ex-ante likelihood of covenant violations is higher (lower) for loans made during high (low) investor sentiment periods. This expectation is realized in equilibrium.

To perform my analyses, I gather loan contract data from Thomsons Refinitiv's Dealscan database. I then merge the information with corporate borrower characteristics in the Compustat database. Data on the likelihood of covenant violations comes from Peter Demerjian's personal

website. The final sample used for the baseline regression consists of 23,436 loan facilities originating from 1996 to 2017.

The primary proxy for investor sentiment in my analysis is the monthly sentiment index developed by Baker and Wurgler (2006). I measure covenants intensity in the debt contract design using three measures- the number of performance and number of capital covenants as developed by Christensen and Nikoleav (2012) and covenants intensity as developed by Bradley and Roberts (2015). Results in the paper are consistent with the hypothesis that the loans initiated during high investor sentiment periods carry tighter covenants and the ex-ante likelihood of covenant violations is higher for loans made during high (low) investor sentiment periods.

Using data from the Ravenpack database, I examine how investor sentiment at the firm level, as derived from news media content, influences the optimal design of debt contracts. I find that lenders respond differently to firm-specific sentiment compared to economy-wide sentiment. Higher firm-level investor sentiment, derived from news media coverage, elicits a distinct response from lenders compared to the Baker and Wurgler sentiment index, which measures sentiment at the economy-wide level.

First, the interpretation and implications of firm-level investor sentiment and economy-wide sentiment differ significantly. Economy-wide sentiment affects all firms uniformly, while firm-specific investor sentiment pertains only to the particular firm in question. Second, a high economy-wide investor sentiment index indicates overall optimism or exuberance in the entire economy. In contrast, a high firm-specific investor sentiment measure suggests that more media outlets have positive news coverage about a specific firm compared to those with negative coverage.

Under the optimal contract design in terms of bargaining equilibrium, firm-specific investor sentiment and the Baker and Wurgler sentiment measure play distinct roles. In the presence of high economy-wide investor sentiment, the broader market exuberance spills over to high managerial sentiment, leading to increased managerial optimism. As a result, managers underestimate the likelihood of breaching debt covenants, thereby increasing the ex-ante probability of accepting higher covenants and lower spreads in the debt contract design. However, the impact of high firm-specific investor sentiment on optimal debt contract design differs from that of economy-wide investor sentiment. I argue that, in both scenarios, the borrowing managers have similar incentives, accepting a debt contract ex-ante with higher covenants and lower spreads. This is because a higher firm-level investor sentiment measure, based on positive news media coverage, implies positive fundamental developments in the firm, leading to higher firm values. In this scenario, the borrowing firm's managers are less concerned about the probability of breaching debt covenants in the future.

My analysis confirms this conjecture, as there is no significant relationship between the likelihood of debt covenant violation and high firm-specific investor sentiment. Interestingly, I also do not find a positive and significant relationship between high firm-specific investor sentiment and covenants intensity. Covenants intensity, as suggested by Bradley and Roberts (2015), measures the extent to which creditors impose restrictions on borrowers' actions. This implies that lenders impose different restrictions when faced with high economy-wide investor sentiment compared to high firm-specific investor sentiment. Further analysis supports this inference, as the number of material restrictions imposed by lenders in the debt contract is significantly lower in the presence of high firm-specific investor sentiment than in the presence of high economy-wide investor sentiment.

This study makes several important contributions to literature. First, while prior accounting research has broadly investigated the association between investor sentiment and corporate disclosure (Bergman and Roychowdhury 2008), stock market response to earnings news (Mian and Sankaraguruswamy 2012), I provide evidence of the influence of investor sentiment on the design of debt contracts in private debt market. Despite the considerable interest in debt contract design, Skinner (2011) argues that our understanding of the economic forces that shape it remains limited. In this study, I show that investor sentiment acts as a significant macro-economic force that impacts the loan spread and loan covenants in the design of debt contracts.

Second, while most existing studies focus on market-level measures of investor sentiment, this study demonstrates that firm-level investor sentiment is a relevant measure beyond the prevailing level of aggregate market-level sentiment in debt contract design.

Finally, this study contributes to the literature on covenant violations. The importance of covenant violations has been studied in literature since the early 1990s (e.g., Sweeney 1994). Recent studies (e.g., Nini, Smith, and Sufi 2012) focus on the consequences of covenant violations. In contrast, this paper examines whether investor sentiment at loan initiation influences the likelihood of covenant violations. I contribute to the literature by linking investor sentiment to debt covenants and their violations, thereby providing insights into how a significant macro-economic force like investor sentiment affect debt contracting ex ante, and consequently, the likelihood of covenant violations ex post.

The remainder of the paper proceeds as follows. Section 2 discusses the relevant literature and develops the research hypothesis. Section 3 explains the research design and methodology. Section 4 describes the data and the sample selection process. In Section 5, I present and discuss the results. Finally, Section 6 provides the conclusion and implication of the research findings.

CHAPTER 2: BACKGROUND AND RELATED LITERATURE

In a frictionless financial market postulated by Miller and Modigliani (1958), how capital is raised is irrelevant and capital structure does not have a material impact on the value of the firm. Their seminal study is the first to establish the independence of capital structure in determining the market value of a firm. Though their study was limited in scope owing to the assumption of non-existence of market frictions, the importance of market frictions and how they affect capital structure decisions and eventually affect the value of a firm has propagated a significant body of work related to the choices between debt and equity and how it either creates or erodes firm value. Schwartz (1959) in another seminal article highlights the nonexistence of an optimal capital structure. Furthermore, a firm's choice of the form of capital is impacted by both rational as well as irrational factors (Stein 1996; Lagunoff and Schreft 1999). More specifically, investor sentiment seems to have a significant impact on asset prices and overall firm values (Da et al. 2015; Brown and Cliff 2005; Hilliard et al. 2020). Given prior research which shows that the ability of lenders to price-protect themselves is impaired in periods of high investor sentiment, it is important to examine whether they can use other contract terms to achieve this goal. Thus, investor sentiment has an impact on debt pricing and given the lenders ability to price-protect themselves is impaired during periods of high investor sentiment; they have to look for alternative mechanisms. In this research, I analyze the nexus between investor sentiment and debt contracting terms.

2.1: Debt Contracting

In debt financing, debt holders lend capital to the borrowers in exchange for promised principal and interest payments in the future. The interest revenue i.e., the loan spread is the primary economic benefit that debt holders obtain from borrowers. But as long as the debt covenants are honored, debt holders do not participate in the borrowing firms' decision making and leave the operating control of borrowers to its shareholders and management (Aghion and Bolton 1992; Dewatripont and Tirole 1994). Consequently, debt holders seek accounting information about borrowers' income generating ability as a gauge of the borrowers' ability to meet interest and principal payment obligations (Ross et al. 2002).

The most important components of a debt contract are interest rates and debt covenants. Debt covenants and the interest rate serve similar functions to compensate creditors for information risk. The interest rate specifically compensates for the default risk facing the debtholders whereas debt covenants are primarily used to mitigate the debtholder-shareholder agency conflicts due to information asymmetry. Moreover, these agency conflicts between shareholders and debtholders could result in investment decisions that favor shareholders but undermine the interests of the debtholders (Jensen and Meckling 1976; Myers 1977; Smith and Warner 1979). Debt covenants, therefore, become a monitoring device that can potentially shift the control rights over the firm to the debtholders upon violation of covenants and hence serve to protect creditors' interests (Chava and Roberts 2008). Given that the providers of debt face an asymmetric payoff structure on loans, their risk assessments are particularly focused on downside risks (Bae et al. 2013; Florou and Kosi 2015).

2.2: Debt Covenants

Debt Covenants are the conditions imposed on borrowers by the lenders. These are the tools extensively used by lenders to protect themselves from ex-post value destroying actions of the borrowers. They have an important role in mitigating information asymmetry and agency problems in debt contracting (Jensen and Meckling 1976; Smith 1993; Smith and Warner 1979). These covenants serve the lenders interests and act as trip wires when lenders specifically face high levels of agency as well as information risk (Demerjian 2017; Dichev and Skinner 2002; Frankel et al. 2008; Chava et al. 2010). Covenants are one of the most common features in loan contracts which require the borrower to take or refrain from certain actions (Rajan and Winton 1995). In binding the actions of the borrower, the lender mitigates some of the risk and agency costs. The purpose of debt covenants is to give lenders an early warning signal about the financial distress of the borrowers and to have the timely transfer of decision rights to the lenders. Given that known and unknown states of nature materialize, covenants ensure the timely transfer of decision rights to the lenders. In fact, these covenants are most critical from the lender's perspective, but they also aid the borrower in effectively limiting bondholder and stockholder conflicts (Healy and Palepu 1990; Billett, King, and Mauer 2006).

The literature on covenants builds on the agency view of the firm (Coase 1937, Jensen and Meckling 1976), which views the firm as a nexus of contracts designed to minimize agency costs resulting from asymmetric information and conflicts of interest among the firm's various stakeholders. Prior literature highlights the agency risk imposed on debtholders by asymmetric information and by unobservable actions of self-interested shareholders and managers that may increase default risk and hurt lenders' interests (Jensen and Meckling 1976; Myers 1977; Stulz

1990). Covenants thus reduce the agency cost of debt ex-ante for lenders by allowing them the means to monitor the borrowers.

However, Holmstrom and Myerson (1983) documents that incentive-efficient contracts do not guarantee efficient outcomes ex-post, that is the contractual features that are efficient ex-ante may imply significantly inefficient outcomes in some states of the world. Hence, even though it is optimal for lenders to include covenants ex-ante in the debt contracts, it may also harm lenders' interests ex-post in certain contingencies by reducing managers' operational and financial flexibility (Smith and Warner 1979).

Thus, optimal contract design involves trade-off between two conflicting forces. There is ex-ante benefit of imposing restrictions on ex-post financial attributes and investment or financial decisions as it reduces the borrower's default risk by better aligning the interests of shareholders and debtholders. But, on the other hand, the incidental loss of operational and financial flexibility may increase the default risk in certain states of the world. The contracting efficiency hypothesis then implies that only those covenants will be included for which the expected benefits exceed the expected loss from reduced efficiency ex-post (Smith and Warner 1979).

In practice, covenant inclusion in private debt is an outcome of negotiations between the borrowing firm and the lending bank(s). Prior studies have shown that there is substantial observed heterogeneity in the number and type of covenants that are included in private debt contracts. So, from a contracting point of view, there is considerable flexibility in covenant design. Armstrong et al. (2010) points out that, in the presence of incomplete contracting, financial performance covenants can lower the transaction costs of reallocation of decision rights ex-post by acting as triggers. There are trade-offs in including covenants because the presence of covenants ex-ante imposes potential costs on lenders and borrowers' ex-post. There is a large and growing empirical

literature on covenants that has also examined the determinants of covenant design and how creditors exercise their control rights over the duration of loans.

2.2.1 Classification of Debt Covenants

Debt contracting literature consistently classifies debt covenants into two board categories, financial covenants, and restrictive covenants. Financial covenants are based on borrower's accounting information whereas restrictive covenants directly pose restrictions or limitations on the borrower's financial and investment activities. Restrictions on dividend payout ratios, stock and debt issues, capital expenditures will be some of the instances of restrictive covenants. Monitoring ability and renegotiation costs play an important role in determining the selection between financial covenants and restrictive covenants. Moreover, the financial and restrictive covenants are distinguishable in terms of their design and empirical prevalence. First, unlike financial covenants, restrictive covenants are not expressed only in accounting terms like restrictions on dividends payout. Second, violation of financial covenants is very common, and earnings volatility can lead to that whereas violation of restrictive covenants is often deliberate acts of management like paying dividends in excess of permissible payout ratio. Third, compared to restrictive covenants, financial covenants are easier to renegotiate as a firm's financial conditions change. Finally, due to the inherent requirement for flexibility of renegotiation, financial covenants are mostly included in private debt contracts whereas restrictive covenants are mostly included in public debt.

2.3: Determinants of Covenant Design at Loan Initiation

2.3.1 Information Asymmetry and Signaling

Prior literature generally shows that covenant intensity and tightness are positively related to the level of information or agency risk. In private debt contracts, borrowers may signal their private information by choosing different covenant threshold designs. Demiroglu and James (2010) document that riskier firms and those with fewer investment opportunities tend to choose tighter financial covenants. They also find that the selection of tight covenants is associated with improvements in covenant variables, reductions in investment spending, and net debt issuance. These results suggest that opting for tight covenants conveys information about future changes in covenant variables, investment, and financial policies, as well as the consequences of covenant violations.

Li et al. (2016) demonstrate that covenants provide underperforming borrowers with a grace period by initially setting less restrictive thresholds. However, they allow these borrowers to gradually convey information to lenders about their future prospects through increasingly demanding subsequent thresholds. Similarly, Robin et al. (2017) indicate that high-quality auditors can encourage fewer and less restrictive covenants by assuring lenders at the beginning of the contract, thereby reducing information and agency conflicts.

The risk associated with presence of information asymmetry will be less severe if the lenders and borrowers have a prior lending relationship (Bharath et al. 2011). Bharath et al. (2011) finds that repeated borrowing from the same lender leads to a reduction in loan spreads by 10-17 basis points, particularly when borrower transparency is low. They also observe that prior lending relationships result in reduced collateral requirements and the ability to secure larger loans.

Ivashina and Jovner (2011) document that bank relationships established through repeated interactions with private equity firms play a crucial role in cross-sectional variation in the loan interest rate and covenant structure as bank relationships formed through repeated interactions reduce inefficiencies from information asymmetry. Prilmeier (2017) demonstrates that covenants tend to become more relaxed over the course of a lending relationship, particularly for opaque borrowers, consistent with information asymmetry theories.

These past studies additionally show evidence that firm-level governance mechanisms (Ge, Kim, and Song 2012), board monitoring (Fields, Fraser, and Subrahmanyam 2012; Francis, Hasan, Koetter, and Wu 2012) and government monitoring (Black, Carnes, Mosebach, and Moyer 2004) are negatively associated with covenant intensity or tightness.

2.3.2 Quality of Accounting Information

Prior studies show that the quality of accounting information affects the selection of specific financial covenants in loan contracts. Demerjian (2011) documents a significant decrease in the use of balance sheet-based covenants, attributed to changes in accounting standards towards fair-value accounting, which has reduced the usefulness of balance sheet information for contractual purposes. In an international study, Ball et al. (2015) demonstrate that the adoption of International Financial Reporting Standards (IFRS) may lead to reduced contractibility of accounting numbers and a decreased reliance on covenants based on accounting information in debt contracts.

Christensen and Nikolaev (2012) classify covenants into two categories based on accounting information: performance covenants and capital covenants. Capital covenants utilize balance sheet information to address agency problems by aligning the interests of debtholders with

those of shareholders. On the other hand, performance covenants, which employ income statement and cash flow information, act as triggers that limit agency problems by transferring control to lenders in unfavorable circumstances. Capital structure covenants can be viewed as attempting to align the interests of shareholders and debtholders ex ante, while financial performance covenants alleviate moral hazard and trigger the reallocation of control rights ex post.

Lenders are also more likely to impose more restrictive covenants if the quality of a borrower's financial information is questionable. Graham et al. (2008) demonstrate that restatements lead to higher loan spreads, shorter maturities, an increased likelihood of collateralization, and more covenant restrictions. Chen et al. (2016) find that loans issued after receiving a material auditor opinion result in higher interest spreads, fewer financial covenants, and a higher presence of general covenants compared to loans issued after receiving a clean opinion. Chava et al. (2018) examines the dynamics of borrower reputation in bank loan markets following instances of financial misreporting. They discover that misreporting firms face higher loan spreads compared to matched firms for at least six years after the revelation of misreporting, and there is no evidence of a decline in the misreporting premium over time. These findings suggest that misreporting leads to enduring and costly reputation losses in the private loan market, which firms find challenging or prohibitively expensive to recover from.

2.4: Trade-off between covenants and other contract terms

The trade-off between covenants and other contract terms plays a crucial role in creditor protection. Creditors safeguard their interests through various means, including both price and nonprice terms such as the interest rate, collateral, maturity, and financial covenants (Myers 1977; Smith and Warner 1979; Barclay and Smith 1995).

Lenders have the option to charge higher interest spreads to compensate for the increased risk associated with riskier borrowers, instead of relying solely on tighter or more covenants. However, charging a high interest spread may exacerbate adverse selection issues. Covenants serve to restrict borrowers' opportunistic behavior and allocate control rights to debtholders in unfavorable situations (Jensen & Meckling 1976, Smith & Warner 1979, Aghion & Bolton 1992). Therefore, covenant protection, to some extent, can act as a substitute for higher interest spreads. Consequently, prior studies find that the inclusion of debt covenants in a debt contract could reduce the interest rate demanded by the borrowers. Bradley & Roberts (2015) find that, even after controlling for the inherent risk of the debt and the simultaneous determination of loan pricing and contract structure, interest spreads and covenants have a negative relationship. Similarly, Reisel (2014) demonstrates that including covenant restrictions on investments and the issuance of higher-priority claims can reduce the cost of debt by 35 to 75 basis points. Chava et al. (2018) show that borrowers who accept covenants with increasing requirements receive a reduction in loan spreads compared to propensity-matched firms that do not signal their creditworthiness.

Covenants are also determined in conjunction with other contract terms. Billett, King, & Mauer (2007) find that covenant protection significantly mitigates the negative relationship between leverage and growth opportunities. This suggests that covenants can help alleviate the agency costs of debt for high-growth firms.

2.5: Covenant Violations and Renegotiation

Firms that are performing poorly are more likely to have stronger restrictions placed on them by the lenders to enforce some discipline and accountability (Aghion and Bolton 1992; Nini et al. 2009; Roberts and Sufi 2009). Covenant violations are relatively common and occur with nontrivial frequency. Debt contracts grant significant discretion to debtholders in the event of a covenant violation, allowing them to waive the violation, review and modify the borrower's financial and investment policies, renegotiate covenant thresholds, or withdraw the loan. Renegotiations of debt contracts, even without reported covenant violations, are frequent. Denis and Wang (2014) find that a substantial portion of debt contracts and renegotiations modify restrictive or financial covenants, with most renegotiations not associated with reported technical defaults. Furthermore, they show that many renegotiations relax existing restrictions based on the borrower's operating and financial conditions at the time. When firms raise capital through debt with covenants and violate those covenants, it triggers a renegotiation in the loan agreement with their respective lenders, leading to significant consequences. Consequences of covenant violations reflect how creditors exercise their control rights outside bankruptcy (Roberts and Sufi 2009).

The consequences of covenant violations are costly for borrowers. Even if borrowers receive a waiver for covenant violations, they still experience adverse effects on their value and financing costs (Beneish and Press 1993). For firms that repeatedly violate covenants with the same lenders, contract terms become more stringent, leading to increased interest spreads in renegotiated contracts (Beneish and Press 1993; Freudenberg et al. 2017).

Covenant violations also result in creditors intervening in firm investment and financial policies. Capital expenditures decline following covenant violations, particularly in firms with more severe agency and information problems (Chava and Roberts 2008; Nini, Smith, and Sufi

2012). Chava and Roberts (2008) show that capital investment decline sharply following a financial covenant violation, when the creditors use the threat of accelerating the loan to intervene in management. Further, the reduction in investment is concentrated in situations in which agency and information problems are relatively more severe. Covenant violations are followed by a decrease in acquisitions, a reduction in financial leverage, and a decrease in shareholder payouts (Nini, Smith, and Sufi 2012; Demiroglu and James 2010). Lenders exercise their control rights to intervene in firm investment decisions by imposing capital expenditure restrictions in renegotiated agreements following covenant violations (Nini, Smith, and Sufi 2009).

Covenant violations also impact lending relationships and access to credit lines. Following a violation, banks restrict the usage of credit lines by raising spreads, shortening maturities, tightening covenants, canceling the line, or reducing its size (Acharya et al., 2014). Chava, Fang & Prabhat (2018) show that borrowers are more likely to switch lenders when they signal through tightening covenant thresholds but then fail to improve their performance. Covenant violations can also lead to CEO turnover and have additional consequences such as higher audit fees, a greater likelihood of receiving a going-concern opinion, and experiencing auditor resignation (Nini, Smith, and Sufi 2012; Bhaskar, Krishnan, and Yu 2016). Debt covenant violations also create information asymmetry and uncertainty, reflected in higher bid-ask spreads, return volatility, and audit fees (Gao et al. 2017).

2.6: Debt Maturity

2.6.1 Debt Maturity Structure: A theoretical framework

The existing debt contracting literature on debt maturity structure has developed around three major theoretical frameworks: the contracting cost theory, tax-based theory, and information asymmetry theory.

The contracting cost theory shows that debt maturity is crucial in addressing the underinvestment concerns as firms with risky debt may discard new profitable investment projects if the majority of projects' returns accrues to debtholders. Myers (1977) shows that the underinvestment problem is more severe if a firm has more growth opportunities as they may lack internal resources to invest in all the available investment projects. Myers (1977) also shows that the underinvestment problem can be constrained by reducing debt in the capital structure, adding restrictive covenants in the debt contract and/ or by shortening the effective maturity of debt. Barnea et al. (1980) also shows that a shorter-maturity debt may alleviate the asset substitution problem given that the value of short-term debt is less sensitive to changes in firm's asset value.

The tax-based theory related to debt maturity examines whether the tax benefits differ for debts with different maturing structures. Brick and Ravid (1985) show that the interest expense for long-term debts is higher than those of short-maturity debts when the yield curve is upward sloping but declines in future. Kim et.al. (1995) argue that the long-maturity debt maximizes an investor's tax timing option value when choosing between repurchasing and reissuing debt.

The information asymmetry theory of debt maturity structure posits that agency problems emanating from asymmetric information can be mitigated by short-maturity debt because such debt subject managers to more frequent monitoring by lenders as a result of frequent renewal (Stulz

2000). The information asymmetry theory of debt maturity also suggests that use of short-maturity debt by high-quality borrowers can serve as a signal to the market of their enhanced prospects in the future. Flannery (1986) and Kale and Noe (1990) propose that firms with high levels of asymmetric information are more likely to issue short-maturity debt because of high information costs.

In the debt contracting literature, information asymmetry theory has been used as the main framework for explaining the determinants of debt maturity structure. Custodio et al. (2013) finds that corporate debt maturity for US firms decreased primarily because of increased information asymmetries.

2.6.2 Determinants of Debt Maturity Structure

Debt maturity structure is an important attribute of debt contracts that has received substantial attention in the literature. Debt maturity choice reflects the incentives to provide information, monitoring, and bonding that are relevant for contracts. The choice of a particular debt maturity structure has costs and benefits for both the lenders and the borrowers. In the context of debt contracting, the structure of debt maturity significantly influences the decision-making of both debtholders and borrowers.

The existing academic literature on debt maturity has focused on two broad strands of literature. One stream of literature has extensively documented the determinants of firms' debt maturity choices (e.g., Barclay and Smith 1995; Custodio et al. 2013). The other strand of literature examines the interaction between debt maturity and other corporate policies, including financial leverage (Barclay, Marx, and Smith 2003; Johnson 2003), debt covenants (Billet et al. 2007), cash holdings (Harford et al. 2014) and retail investment (Aivazian et al. 2005; Almeida et al. 2011).

Managers choose the debt maturity structure to maximize a firm's value in alignment with leverage, liquidity, and dividend policies.

In this section, I review the empirical literature on the determinants of debt maturity structure. The literature broadly classifies the determinants of debt maturity structure into three categories: firm-specific, corporate governance and macro-economic determinants of debt maturity structure.

2.6.2.1 Firm-Specific determinants of debt maturity structure

Theoretical framework on debt maturity structure is based on the agency cost of debt and the information asymmetry risks. Thus, the firm-specific factors that contribute to an increase or decrease in information asymmetry will have an impact on the firms' debt maturity structure. One such firm-specific factor is firm size. Larger firms have a lower risk of information asymmetry and better access to long-maturity debt as they have more tangible assets in relation to future investment opportunities. Also, the agency theory suggests that, unlike small firms, conflicts between shareholders and debtholders are less severe for large firms. Scherr and Hulburt (2001) examine the determinants of debt maturity structure for small firms, arguing that small firms differ from large firms in taxability, information asymmetry, ownership, economies of scale, and access to financial markets. Cai et.al. (2008) find that the firm size, asset maturity and liquidity have a significant and positive impact on debt maturity.

The next important firm-specific determinant of debt maturity structure is firm leverage. Literature suggests that debt maturity and leverage choices are interdependent. Firms opting for higher leverage often choose debt of longer maturity to mitigate bankruptcy risks. Barclay and Smith (1996) and Stohs and Mauer (1996) document that firms with greater growth opportunities have both shorter debt maturity and lower leverage. Dang (2011) finds that firms facing higher

growth opportunities reduce leverage, but debt maturity is not affected by this reduction. Overall, literature finds that liquidity risk and financial flexibility consideration play an important role in determining the joint choice of leverage and maturity.

A firm's financial reporting quality and choice of auditors also play a role in determining debt maturity structure. Earnings management by firm decreases the quality of financial reporting which in turn increases the risk for lenders as decreases in the quality of financial reporting leads to increases in information asymmetry and adverse selection problems. Bharath et. al. (2008) documents that reduce the maturity structure of debt along with imposing other restrictive loan conditions when faced with increased information asymmetry and adverse selection problems. Pappas et al. (2019) shows that firms with higher real earnings management have significantly lower debt maturities. Graham et al. (2008) shows that the likelihood of receiving short-maturity debt increases significantly after financial reports restatements. High-quality audit is also likely to result in high-quality financial reporting and may substitute for short-term debt for monitoring purposes. Francis (2004) shows that audits conducted by Big 4 firms constrain misreporting. This in turn could reduce the information asymmetry between lenders and borrowers. El Ghoul et al. (2016) show that firms with Big 4 auditors receive long-maturity debt and this association is more salient in countries with strong legal institutions. Myers (1977) suggests that, based on contracting cost theory, firms with more growth opportunities should use debt maturity to address problems related to underinvestment.

2.6.2.2 Corporate Governance based determinants of debt maturity structure

Corporate governance plays a crucial role in balancing the interests of various stakeholders within a company. The internal and external components of corporate governance have a

significant impact on the process of debt contracting and renegotiation by influencing the agency costs of debt and the risk of asymmetric information (Armstrong et al. 2010).

Prior studies on internal corporate governance and debt maturity have documented several factors which influence the choice of debt maturity structure. Datta et al. (2005) demonstrate that higher managerial equity ownership aligns the interests of managers and shareholders, which may lead to the use of short-term debt as managers are incentivized to engage in riskier projects. Similarly, Tanaka (2016) finds that firms with higher managerial ownership tend to issue short-maturity bonds in Japan. Benmelech (2006) finds that entrenched managers prefer longer-term debt to avoid the risk of liquidation. Overall, the influence of internal corporate governance factors on debt maturity decisions highlights the importance of aligning managerial incentives, mitigating agency costs, and considering ownership structure in the debt contracting process.

Prior research also examines the impact of executive compensation structure on debt maturity choice. It suggests that the executive compensation structure mitigates the agency costs of debt resulting from executive compensation. Brockman et al. (2010) provides evidence of a negative (positive) association between chief executive officer portfolio deltas (vegas) and short-maturity debt. Dang and Phan (2016) document a positive association between CEO inside debt holdings and short-maturity debt consistent with the argument that inside debt can alleviate refinancing risk associated with short-maturity debt.

Research studies also examine how CEO-specific characteristics affect debt maturity choice. CEO overconfidence has a substantial impact on corporate decision making. Hackbarth (2008) incorporates managerial traits into a tradeoff model of capital structure to study its impact on corporate financial policy and firm value. They document that optimistic and/or overconfident managers choose higher debt levels and issue new debt more often. Studies also show that maturity

structure can be used as a monitoring tool for overconfident managers because of the agency cost associated with a manager's actions. Huang et al. (2016) examines whether and to what extent overconfident CEOs affect maturity decisions. Consistent with a demand side story, they find that firms with overconfident CEOs tend to adopt a shorter debt maturity structure by using a higher proportion of short-term debt. Petkevich and Prevost (2018) find that firms run by more able managers can issue bonds with longer maturity. Ataullah et al. (2018) find that the overconfidence of the CEO based on insider trading has a more substantial impact on corporate debt maturity than other types of CEO overconfidence.

2.6.2.3 Macro-economic determinants of debt maturity structure

During periods of high macro-economic uncertainty, the risk of information asymmetry becomes more prominent, leading to volatile future cash flows that may compromise borrowers' ability to meet their debt obligations. Datta et al. (2019) examines the effect of policy uncertainty on corporate debt maturity structure. They find that heightened levels of policy uncertainty prompt firms to opt for shorter debt maturity. This indicates a greater reluctance among firms to commit to long-term debt obligations, reflecting an increased aversion to risk during periods of high policy uncertainty. Tran and Phan (2022) examine the relation between government policy uncertainty and debt contracting in publicly traded firms in the United States. Their findings demonstrate that policy uncertainty is associated with more stringent debt terms for financially constrained firms. This includes shorter debt maturity, higher cost of debt, and more restrictive debt covenants. The rationale behind these outcomes is the fact that government policy uncertainty increases the volatility of cash flows and default risk for borrowers, leading lenders to impose stricter terms to mitigate their own risk exposure.

Financial crises also have significant implications for firms' borrowing decisions. Chen et al. (2021) provides empirical evidence linking firms' maturity choices to their systematic risk exposure and macroeconomic conditions. They document several facts about corporate debt maturity: debt maturity is procyclical, higher-beta firms tend to have longer maturity and shorter maturity amplifies the sensitivity of credit spreads to aggregate shocks. Gonzalez (2015), in an international study, analyzes the effect of global financial crisis on debt maturity for a sample of 39 countries. They document that both short- and long-term leverage increased during the financial crisis compared to the average leverage in the period before the crisis. Also, the results highlight that the increase in short-term debt is higher than in long-term debt, leading to a reduction in corporate debt maturity.

2.7: Investor Sentiment

Investor sentiment refers to the phenomenon where investor beliefs about future firm values deviate significantly from fundamental information (De Long et al. 1990; Morck, Shleifer, and Vishny 1990; Baker and Wurgler 2006, 2007). Broadly. it represents the optimism or pessimism regarding the performance of firms in general, and investors' perception of future cash flows differs significantly from firm fundamentals. Prior literature has defined investor sentiment in different ways and has established that reasonable proxies of investor sentiment can be identified, and sentiment has discernible and regular effects on the stock market. (Brown and Cliff 2005; Baker and Wurgler 2006; Kaplanski and Levy 2010; Hilliard et al. 2020). This literature finds that when sentiment is high, investors' propensity to speculate is high, so they place excessively optimistic valuations on future expected cash flows associated with risky assets such as stocks, either by overestimating the size of the cash flows or by underestimating the risk, leading them to overvalue stocks. The reverse is true for low sentiment periods. This contemporaneous

mis-valuation due to sentiment reverses in the future, thereby creating a negative relation between sentiment and future risk-adjusted returns, especially for more speculative stocks. Moreover, investor sentiment can lead to firm-level mis-pricings that persists over long periods of time (De Long et al. 1990; Shleifer and Vishny 1997; Brown and Cliff 2005; Baker and Wurgler 2006, 2007).

Behavioral models of investor behavior suggest that sentiment-driven investors hold temporary erroneous stochastic beliefs that temporarily drive prices away from fundamental values (De Long et al. 1990). Brown and Cliff (2005) find that the equity market becomes significantly overvalued during periods of high investor sentiment, leading to subsequent underperformance over the following three years as the overvaluation corrects itself. Baker and Wurgler (2006) find that the cross-section of future stock returns is conditional on proxies for sentiment at the beginning of the period. Dannolt et al. (2015) note that investors tend to overestimate potential synergies and underestimate risks in M&A deals when market-wide investor sentiment is high.

Prior research finds that investor sentiment is significantly associated with various corporate, financing, and investment decisions, ultimately affecting firm value (Grundy and Li 2010; Du and Hu 2020; Danso et al. 2019; Butler et al. 2011). The existing body of literature extensively explores the relationship between investor sentiment and various financial market outcomes, considering both the time-series and cross-section of stock returns. However, the majority of these studies have predominantly focused on market-level investor sentiment. More recently, a growing body of research has emerged that utilizes firm-specific investor sentiment to elucidate firm-specific phenomena in financial markets. A study conducted by Aboody et al. (2018) investigates the impact of firm-specific corporate announcements, employing firm-specific investor sentiment as a measurement. They argue that firm-specific investor sentiment offers a

superior measure compared to market-level sentiment because it exhibits variations over time and across different firms. In contrast, market-level sentiment remains the same for all firms at a given point in time and is limited in terms of its updating frequency. A measure of firm-specific investor sentiment should help explain the impact of investor sentiment on debt contract design above and beyond the prevailing level of market-based investor sentiment measures.

CHAPTER 3: HYPOTHESIS DEVELOPMENT

3.1: Investor Sentiment and Debt Covenants

The concept of Investor Sentiment is not homogenously conceptualized, and prior research has defined the measure in different ways. I follow Baker and Wurgler (2006) in defining Investor Sentiment. Investor Sentiment could potentially affect the intensity of financial covenants in different ways. One may argue that lenders are less likely to use financial covenants during high investor sentiment because of their optimism and belief in the firm's ability to meet debt payments. On the other hand, if the lenders can see through the optimism, they are more likely to use financial covenants during high investor sentiment periods to mitigate the risk that arises from investor over-exuberance. High sentiment periods lead to more price competition among lenders resulting in erosion of ability to price-protect themselves against potential price reversals due to deterioration in investor sentiment. This leads to lenders using other tools that will transfer decision rights to lenders should the circumstances change. One such tool is financial covenants in debt contracts. Given that sentiment affects lenders' stability and the fact that they cannot price protect, lenders protect themselves by having more covenants. On the other hand, when sentiment is high, managerial optimism is also high, so they are underweight on the probability of breaching covenants. This raises the ex-ante likelihood of accepting greater or tighter covenants in exchange for lower spreads in equilibrium. This consideration evolves into my first hypothesis, which is stated below.

Hypothesis 1: Loans made during high (low) investor sentiment periods carry higher (lower) covenants, ceteris paribus.

3.2: Investor Sentiment and Covenant Violations

During periods of high investor sentiment, assets may be overvalued because of optimism and the expected future cash flows. As a consideration in loan contracts, banks or lending institutions typically have a combination of income statement and balance sheet-based covenants. If these asset over-valuations which are a result of investor optimism, don't materialize, the likelihood of ex-ante covenant violations will be higher for loans made during high sentiment periods than during low sentiment periods. Also, managerial overconfidence in high sentiment period leads them to accept covenants that are too tight or a greater number of covenants because they believe that they will not violate them, but eventually end up violating the covenants frequently. This consideration emerges as my second hypothesis, which is stated below.

Hypothesis 2: The likelihood of covenant violations is higher (lower) for loans made during high (low) investor sentiment periods, ceteris paribus.

3.3: Investor Sentiment and Debt Maturity

Debt maturity is an important feature of debt contracts which has received substantial attention in the literature. Investor sentiment may incentivize creditors to shorten debt maturity for several reasons. Investor sentiment can undermine borrowing firms' debt repayment ability by increasing their operating risk and cash flow volatility. Short-maturity debt reduces contracting costs and mitigates conflicts between shareholders and debtholders. From the lenders' perspective, granting loans with short-term maturity provides them with control rights ex-post, enabling effective borrower monitoring. This monitoring function enhances information transparency and mitigates information problems Under these conditions, lending short-term debt will be less risky for creditors as short-term debt can help creditors to better monitor firm management (Rajan and

Winton 1995; Stulz 2000). Custodio et al. (2013) document an increased utilization of short-term debt in firms with higher levels of information asymmetry, underscoring the importance of shorter debt maturity in mitigating information asymmetry between shareholders and debtholders.

In particular, the choice between short-term and long-term debt in the presence of high investor sentiment remains uncertain. Firms with greater short-term debt face close scrutiny of their investment policies as they undergo more frequent renegotiations and borrower scrutiny (Jensen and Meckling 1976). Graham et al. (2008) demonstrate that banks reduce loan maturities for firms that have previously engaged in financial misreporting. Mitchell (1991) finds that firms with non-traded stocks are more likely to issue shorter-term debt to minimize costs arising from informational asymmetry. Moreover, due to exposure to higher interest rate risk, lenders may be less willing to lend long-term debt when investor sentiment is high. Because short-term debt needs to be constantly renegotiated and rolled over, issuing shorter maturity debt will be perceived as less risky by the lenders in the presence of high investor sentiment.

Furthermore, short-term debt serves as a signaling mechanism for managers to assure investors and enhance the reputation of firms. It is well-documented that short-term debt mitigates agency costs resulting from information asymmetry, as its value is less influenced by borrowers' private information (Barnea et al. 1980; Barclay and Smith 1995). Conversely, the pricing of long-term debt is more sensitive to information asymmetry, leading to higher information costs. In an asymmetric information framework, where insiders possess superior information compared to outside investors, Flannery (1986) and Kale and Noe (1990) demonstrate that long-term debt can be more prone to mispricing than short-term debt. In the presence of information asymmetry between the firm and investors, short-term debt acts as a signaling mechanism, with high-quality firms issuing short-term debt to signal their quality, while low-quality borrowers prefer relatively

overpriced long-term debt to minimize issuance costs associated with rolling over short-term debt. Therefore, firms with favorable private information issue short-term debt to reduce borrowing costs when favorable information becomes evident. (Flannery, 1986; Kale and Noe, 1990). This consideration emerges as my third hypothesis, which is stated below.

Hypothesis 3: Loan maturity will be lower (higher) for loans made during high (low) investor sentiment periods, ceteris paribus.

CHAPTER 4: RESEARCH DESIGN

The relevance and importance of modeling, analyzing and studying the interlinkages between private debt, investor sentiment, terms and constraints integral to private debt, impact of investor sentiment on debt issuance, violations of the terms of private debt, the impact of the violations in future capital raising activities of the firm, the cost of debt to the firm, etc. has increased significantly due to the recent emphasis on research on non-traditional factors impacting the terms of capital raising (Zhiming Ma et. al. 2022; Hilliard et. al. 2020; Lim et. al. 2020; Robin et. al. 2017; Demerjian 2017; Devos et. al. 2017; Bradley and Roberts 2015; Hyun Hong et. al. 2015). Regardless of whether these recent studies highlight the importance of non-traditional factors or not, the research involving the impact of investor sentiment on specifically debt covenants is non-existent to the best of my knowledge. With this as the backdrop, I would like to explain the empirical model used in this analysis.

4.1: Empirical Model

4.1.1 The effect of investor sentiment on debt covenant structure

I am interested in the effect of investor sentiment on the intensity of debt covenants. The most robust method to estimate this effect is using an ordinary least squares (OLS) regression model. I use the OLS model depicted below to conduct the analysis. The covenant structure or the financial covenant intensity for a specific loan facility ‘i’ that a firm borrowed in year ‘t’, is given by.

$$Financial\ Covenant\ Intensity_{it}$$

$$= \beta_0 + \beta_1 High\ Sentiment_{it-1} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it}$$
$$+ \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it}$$
$$+ \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1}$$
$$+ \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \quad (1)$$

I define financial covenant intensity as the number of financial covenants in a loan contract following (Chava et al. 2008; Demiroglu and James 2010; Nini et al. 2012; Falato and Liand 2016). The key variable of interest is the *High Sentiment*. A positive and significant coefficient on β1 will indicate that lenders impose greater covenant intensity in periods of high investor sentiment. This is consistent with the notion that banks, or lending institutions understand the pervasiveness of over-exuberance and will strive to mitigate their exposure by placing more covenant restrictions for loans extended during high sentiment periods. On the other hand, an insignificant or negative coefficient on this variable will indicate either a lack of difference in lenders decision making due to high sentiment or the shortcoming of lending institutions to subsume a factor that could potentially affect the indication of inherent risk and value of the firm (Aboody et al. 2018; Bouteska 2019; Hilliard et al. 2020). Also, the lower covenant intensity value during periods of high investor sentiment will be consistent with bargaining powers being in the hands of the borrowers and the lenders' ability to impose higher covenants and to pass on the risk being limited which leads lenders to absorb the additional risk.

4.1.2 The effect of investor sentiment on the likelihood of covenant violations

I examine the effect of investor sentiment on the likelihood of covenant violations. In order to estimate this relationship, I use the following OLS regression model, which follows (Demerjian 2017; Chava et al. 2008; Bradley and Roberts 2015; Demiroglu and James 2010).

$$\begin{aligned} Violation_{it} = {} & \beta_0 + \beta_1 High\ Sentiment_{it-1} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} \\ & + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} \\ & + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} \\ & + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned} \quad (2)$$

I define *Violation* as the ex-ante likelihood of covenants being violated at the time of contract initiation. Data on the likelihood of covenant violations comes from Peter Demerjian's personal website. The key variable of interest in equation (2) is High Sentiment. A positive and significant coefficient on β1 will indicate that covenants are set tighter or there are more covenants which will lead to higher covenant violations in the future. Dang and Xu (2018) documents that higher market sentiment spills over to higher managerial sentiment which impacts R&D investments. Thus, managers who are over-confident in periods of high investor sentiment will accept tighter covenants that are more likely to be violated in future in exchange for lower spread.

4.1.3 The effect of firm-specific investor sentiment on debt covenant structure

I am interested in the effect of firm-specific investor sentiment on the intensity of debt covenants. I use the OLS model depicted below to conduct the analysis. The covenant structure or the financial covenant intensity for a specific loan facility 'i' that a firm borrowed in year 't', is given by.

$$Financial\ Covenant\ Intensity_{it}$$

$$= \beta_0 + \beta_1 Firm\ Sentiment_{it-1} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it}$$
$$+ \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it}$$
$$+ \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1}$$
$$+ \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \quad (3)$$

I define financial covenant intensity as the number of financial covenants in a loan contract following (Chava et al 2008; Demiroglu and James 2010; Nini et. al. 2012; Falato and Liand 2016). The key variable of interest is the *Firm Sentiment*. A positive and statistically significant coefficient on β1 will indicate that lenders impose higher covenants in periods characterized by high firm specific investor sentiment. This is consistent with the notion that lenders and borrowers, in their optimum bargaining process, will reach an agreement where ex-ante borrowers agree to higher covenants in exchange for lower spreads. On the other hand, an insignificant or negative coefficient on firm sentiment variable will indicate that the high firm specific investor sentiment has no impact on the optimal contract between lenders and borrowers.

4.1.4 The effect of firm-specific investor sentiment on the likelihood of covenant violations

I examine the effect of firm-specific investor sentiment on the likelihood of covenant violations. In order to estimate this relationship, I use the following OLS regression model, which follows (Demerjian 2017; Chava et al. 2008; Bradley and Roberts 2015; Demiroglu and James 2010).

$$Violation_{it} = \beta_0 + \beta_1 Firm\ Sentiment_{it-1} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \quad (4)$$

I define *Violation* as the ex-ante likelihood of covenants being violated at the time of contract initiation. Data on the likelihood of covenant violations comes from Peter Demerjian's personal website. The key variable of interest in equation (4) is Firm Sentiment. A positive and significant coefficient on β1 will indicate that covenants are set tighter or there are more covenants which will lead to higher covenant violations in the future. On the other hand, an insignificant and negative coefficient on β1will indicate fewer covenant violations in the future. A negative coefficient will also be consistent with a positive fundamental development leading to higher firm values and reduced covenant violations in the future. In such cases, managers exhibit lower concerns regarding the likelihood of covenants violation in the future and during the optimal bargaining process, are willing to accept higher covenants ex-ante.

I provide a detailed description of the dependent, independent, and control variables in the following sub-sections. A precise definition of all the variables used in Eq. [1] to Eq. [4] are presented in the Appendix.

4.2: Dependent Variable

In this research, I use three measures of debt covenants – performance covenants, capital covenants and covenant intensity. Financial covenants are classified into two categories: capital covenant and performance covenants (Christensen and Nikolaev 2012). Capital covenants are balance sheet based which require borrowers to maintain the stated capital and net worth values.

Maintaining the stated capital and net worth values within the firm aligns the debt holder-shareholder interests. This is also an effective way to minimize the agency cost of debt within the firm's capital structure. On the other hand, performance covenants emphasize current profitability and debt repayment abilities in terms of only income statement information or in combination with balance sheet information. These performance covenants provide lenders with an option to restrict managerial actions, which is a way of contingent allocation of control to the lenders, thereby reducing agency cost.

Covenant intensity as suggested by Bradley and Roberts (2015) is an index variable measuring the degree to which creditors impose restrictions on the actions of the borrowers. The index is calculated as the sum of the following six covenant categories (1) collateral, (2) dividend restriction, (3) presence of more than two financial covenants, (4) asset sales sweep, (5) equity issuance sweep, and (6) debt issuance sweep. The index ranges from 0 to 6 and a higher index implies a greater restriction on the borrower's management and vice versa.

4.3: Independent Variable

4.3.1 Macro-economic Firm Sentiment Measure

A number of measures have been suggested for investor sentiment in prior research. As Baker and Wurgler (2006), state "there are no definitive or uncontroversial measures". Ensuing this, I measure investor sentiment using the monthly market – based sentiment series constructed by Baker and Wurgler (2006). Baker and Wurgler index is formed by taking the first principal component of six measures of investor sentiment. The six measures are the closed – end fund discount, the number and the first – day returns of IPOs, NYSE turnover, the equity share in total

new issues and the dividend premium. The Baker and Wurgler index is a comprehensive measure which appears to capture the most chronicled accounts of fluctuations in investor sentiment.

4.3.2 Firm-Specific Sentiment Measure

To compute firm-level investor sentiment, I adopt a measure consistent with previous studies (Bushman et al. 2017) by utilizing Ravenpack's monthly news investor sentiment indicators. Ravenpack provides data on the total monthly count of positive, negative, and neutral news articles associated with each firm. Additionally, it supplies a total count of news articles for each firm, which is obtained by summing the positive, negative, and neutral articles related to that specific firm. However, in my analysis, I exclude the total count of news media articles since it would serve as a proxy for firm attention rather than a direct measure of firm-level sentiment. To compute the firm-level investor sentiment, I employ the following methodology:

$$Media_{Sent} = \frac{(No.of\ Positive\ News\ Articles - No.of\ Negative\ News\ Articles)}{Total\ Number\ of\ News\ Articles} \qquad (5)$$

To ensure that the results are robust to alternative specifications, I also calculate firm-specific investor sentiment as

$$Media_{Sent} = \frac{(No.of\ Positive\ News\ Articles)}{(No.of\ Positive\ News\ Articles + No.of\ Negative\ News\ Articles)} \qquad (6)$$

4.4: Control Variables

I follow previous research on investor sentiment (Mian and Sankaraguruswamy 2012, Bergman and Roychowdhury 2008) and debt covenants (Robin et al. 2017, Lim et al. 2020) in

setting up the control variables used in this study. Loan characteristics include maturity (*Ln [Maturity]*), deal amount (*Ln [Deal Amount*]), all-in spread (*Ln [Spread]*), collateral (*Collateral*) and performance pricing (*performance pricing*). Borrower characteristics include sales (*Sales*), leverage (*Leverage*), current ratio (*Current*), tangibility ratio (*Tangibility*), return on assets (*ROA*), cash holding (*Cash Holding*) and market to book ratio (*MB_Ratio*). Consistent with prior research (Bergman and Roychowdhury 2008), I add firm dummies to control for potential firm effects. The standard errors are clustered at the lender level.

4.5: Poisson Regression

To utilize the data most efficiently and analyze effectively and ensure that this study can be applied for deriving the most generic and right types of insights, I also use the poisson regression model following prior research (Badoer et al. 2020; Graham et al. 2008; Arena and Dewally 2012; Eisenberg et al. 1998).

With a continuous predictor variable like *Spread* or *Deal Amount*, the poisson regression implies that a unit change in the predictor leads to a percentage change in the probability of violations or the actual covenants themselves. i.e., 10 more points on the loan spread is associated with e.g., 25 percent more probability of covenant violations. In contrast, normal OLS regression associates 10 more points on the loan spread with a fixed amount, say 2 more covenants violations.

OLS regression of covenants and covenant violations on predictors will yield consistent parameter estimates as long as the conditional mean of covenants is linear in the predictors. But this is often inadequate since it allows the predicted number of covenants or covenant violations to be zero, which creates certain challenges.

Unless there are large number of loan spread data spread over many companies and industries, the covenant violation data will mostly be rather low. This limitation in the availability of the data can pose certain challenges. In fact, I would predict zero-violations, i.e. most companies don't violate the covenants, which implies a lot of zero values for the number of firms violating the covenants, and in addition to this fact, some good companies are likely to get quite a low number of covenants restrictions. This messes with the assumptions of the OLS model and calls into running a Poisson regression model. Poisson regression comfortably dominates Normal OLS when the data availability is limited.

4.6: Simultaneity – Joint Determination of Spread and Covenants

The purpose of this section is to illustrate why joint determination of the spread and covenants is essential as part of the research design.

The OLS estimates of performance covenants, capital covenants, covenant intensity and loan spread are biased downward in the presence of simultaneity. To understand the effect of simultaneity in OLS estimates, consider the following simple system of equations, where 'y' is loan spread and 'x' is either performance covenant, capital covenant or covenant intensity:

$$y_{t+1} = \beta x_t + u_{t+1} \qquad (7)$$

$$x_t = \alpha y_{t+1} + v_t \qquad (8)$$

The coefficient β represents the effect of covenants on loan spread. To get an unbiased and consistent estimate of $\hat{\beta}$ we need the exogeneity condition that the covariance is zero. Roberts and Whited (2012) in a simple system of equations as depicted in (7) and (8) show that in the absence of the exogeneity condition, bias that depends on the signs and magnitudes of the coefficients α and β exists. This bias could be addressed by using the IV/2SLS estimates. I start by estimating

the first-stage regression similar to Murfin (2012) but using the loan spread. In the second-stage regression, I exploit the variation in the covenants (performance, capital, or intensity), which is used as the dependent variable in that stage. Along with the point estimates I also use the Wald test to test the null hypothesis that the instrument is not relevant and weak.

CHAPTER 5: DATA, SAMPLE SELECTION AND SUMMARY STATISTICS

5.1: Data

The data used in this study comes from several sources. Specifically, four different sources are employed to gather the main data and it encompasses: (1) covenants structure data, (2) likelihood of covenants violations data, and (3) accounting, financial and Standard & Poor's (S&P) long-term credit data, and (4) investor sentiment data. Covenant's structure data, measured as: performance covenants, capital covenants and covenants intensity, are obtained from the Loan Pricing Corporation's, LPC Dealscan database. This database contains detailed information about primarily syndicated commercial loans made to US firms. It also has loan data about non-US firms, but the coverage is limited due to the varying requirements of loan documents in different countries. Dealscan data covers by value, between 50% to 75% of all commercial loans in the US after 1995 (Carey and Hrycray 1999; Bradley and Roberts 2015; Roberts and Sufi 2009).

Dealscan data consists of loan contracts identified as packages. Each observation in the Dealscan data refers to a newly originated loan facility and a package in the same data consists of one or more facilities. Some of the terms on the loan contract like covenants, performance pricing, material restrictions, collateral requirements, are listed at the package level. Other loan attributes like all-in spreads and maturity vary at the facility level. Data on the likelihood of covenant violations comes from Peter Demerjian's personal website[1]. The information for accounting, financial and Standard & Poor's (S&P) long-term credit ratings data is gathered from Compustat database. Finally, while prior research suggests several proxies for investor sentiment, given the lack of consensus on which measure is best, I use Baker and Wurgler (2006) measure of investor

[1] https://peterdemerjian.weebly.com/

sentiment. This is a composite measure which is based on the common variation in several well identified proxies like (1) the closed end fund discount, (2) the number of initial public offerings (IPOs), (3) the average first day returns of the IPOs, (4) New York Stock Exchange (NYSE) share turnover, (5) the equity shares in new equity and debt issues, and (6) the dividend premium. Finally, firm-level investor sentiment is computed using news investor sentiment indicators from the Ravenpack database. Table 1 summarizes the data-collection procedures and the distribution of the sample data by industry and year.

5.2: Sample Selection

As a result of the data acquisition and merging of the sample data from multiple sources, my sample selection process requires explanation. First, I construct the sample using loan data from Thomson Refinitiv's Dealscan database from 1996 to 2017. I limit the data to the years after 1996 because, prior to that time period the data on Dealscan may be replete with completeness and quality issues. For this time period, I have a total of 270,204 observations, where each observation refers to a newly originated loan facility.

<<Insert Table 1 here<<

As reported in Table 1, I apply the standard filters to the Dealscan data. I exclude loans made to non-US borrowers and non-US currency deals which drops 152,551 observations. The observations dropped using this filter accounts for nearly 56.46% of the entire observations in Dealscan for the years 1996 to 2017. Next, my exclusion of loans is where London Interbank Offered Rate (LIBOR) is not the base spread. This drops an additional 23,031 observations. This accounts for nearly 8.52% of observations from my starting sample. Cumulatively this results in 64.98% of my original sample being dropped. Also, because of missing all-in spread and deal

amount, another 966 observations are dropped. This accounts for only 0.37% of the observations from my original sample.

Following prior research (Robin et al. 2017; Lim et al. 2020; Qian and Strahan 2007), I exclude loans to financial services industry (SIC codes 6000 to 6999), loans to utilities and regulated industries (SIC codes 4900 to 4999) which drops 18,795 observations. This accounts for almost 6.96% of my original sample and cumulatively using all the above-mentioned filters I lose 72.31% of my original sample. These lists of filters that reduce the overall sample are consistent with prior research and produce a sample that focusses on debt covenants for the US market. I merged the resulting sample with the Compustat database using the linking file provided by Michael Roberts on his website (Chava and Roberts 2008)[2]. This merging process drops an additional 51,395 observations. This accounts for almost 19.02% of the observations from my initial sample. The final sample, which I use for testing my hypothesis 1, includes 23,436 loan facilities originated between 1996 and 2017. Though cumulatively I have lost 91.33% of my observations from the original sample, owing to various filters for conducting a meaningful hypothesis test, my final sample still has a sizeable number of observations using which I can conduct an analysis. To test hypothesis 2, I use the ex-ante likelihood of covenants violations data provided by Perter Demerjian in his website (Demerjian and Owens 2016). Merging my final sample of 23,436 observations with the Demerjian data to test hypothesis 2 results in 4,730 further observations being dropped resulting in a sample of 18,706 to test only hypothesis 2. These 4,730 observations account for another 1.75% of my original sample that I started off with, making my cumulative total 93.08%.

[2] https://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-12/index.html

Panel B of Table 1 reports the sample distribution by Fama and French (1997) 12- industry classifications[3]. Following prior research (Chava et al. 2019; Demerjian 2017; Frankel and Litov 2007), I exclude observations in utilities and finance, which leaves ten industries based on Fama and French (1997) 12 industry classifications in the sample. It is interesting to note the distribution of loans amongst the different industry sectors and the Telephone and Television sector leads the distribution with 15.35% of the total facilities extended by lenders. This is followed closely by consumer durables which has a 15.26% and the healthcare, medical equipment and drugs which has a 12.83% of the total facilities extended by lenders. The third largest distribution by industry in my sample is followed by business equipment at 8.01% of the total loan facilities. The sample also contains around 20% of total loans to other industries that do not fall within the Fama and French 12-industry classification.

The Energy and Chemical and Allied Products sector have the lowest distribution percentages of 3.44% and 3.88% respectively, highlighting the significant differences in the total facilities extended by lenders. Panel C of Table 1 reports the sample distribution by year, and it is evident that on average, the numbers of companies, numbers of packages and number of facilities have all been decreasing through time. As much as the year 1996 had 1440 facilities, year 2017 only had 32 facilities. Griffin et. al. (2019; 2021) find evidence to support this outcome and state that lenders today rely less on restrictive covenants as opposed to 20 years ago. It is critical to note that the number of facilities significantly started declining post the subprime crisis in 2007 and contrasting it over the dot-com crisis in 2001, which did not affect the number of facilities as much. The likely reason for this difference could be nature and the reason for the crisis itself. While one was triggered by the rise and fall of technology stocks, the other was set in motion due to the sharp

[3] https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library/det_12_ind_port.html

increase in high-risk mortgages that went into default and are more in alignment with lending institutions.

5.3: Descriptive Statistics

Table 2 presents the summary statistics for the sentiment variables, loan characteristics and firm characteristics used in the main model of this study. Consistent with prior studies enumerated in the previous sections and subsections, I winsorize all the continuous variables at the 1st and 99th percentile to address the potential effects of outliers in my analysis.

<<Insert Table 2 here<<

As shown in Table 2, the average investor sentiment is 0.19 which shows that in general there is slight optimism in the economy and among the investors. The firm-specific sentiment mean value is 0.64 which shows that on average media coverage is much higher for positive firm developments than negative ones. Loans on average have 2.04 financial covenants consistent with prior studies (Kim, Song et al. 2011; Demerjian and Owens 2016; Demerjian 2017). Financial covenants are further classified into two categories: capital covenant and performance covenants (Christensen and Nikolaev 2012). Capital covenants are balance sheet based which require borrowers to maintain the stated capital and net worth values. On the other hand, performance covenants emphasize current profitability and debt repayment abilities in terms of only income statement information or in combination with balance sheet information. I find that loans on average have 1.75 performance covenants and 0.56 capital covenants. These statistics are marginally different from some prior studies due to several reasons. First the timeline on the prior studies does not capture certain specific crisis periods after which there has been a significant change in the number of facilities. Second the Dealscan data has been updated with more facilities

post some of the prior research and finally the linking file has been updated to account for maximum number of facilities and packages.

The average loan spread is around 220 basis points, the mean loan size is $634 million, and the average loan maturity is 47 months. These average statistics are consistent with prior studies (Chava and Roberts 2008; Prilmeier 2017; Wang 2017). For the borrower characteristics, an average firm has sales of $2669 million, leverage ratio of 0.34 and current ratio of 1.93. The average firm also has a tangibility score of 0.31, cash holding of 0.09 and market to book ratio of 1.79. The ex-ante likelihood of covenant violation for an average loan is 0.40. Borrowers are more likely to violate performance covenants with an ex-ante likelihood of violation being 0.36 than the capital covenant measure of 0.09. These loan and borrower characteristics are consistent with the previous literature (Robin et al. 2017, Lim et al. 2020).

<<Insert Table 3 here<<

Table 3 presents the correlation matrix for all the variables used in this study. To highlight, the log of spread has a negative correlation with deal amount, performance pricing and capital covenants. This is intuitive and in alignment with economic theory. All the other correlations in the matrix for the most part is similar to prior studies and not raise any concerns about multicollinearity.

5.4: Alternate Measures

There are several alternate measures of data used in this study to first address certain possible outcomes and second to delve deeper into analyzing the main results. Overall, there are three categories of data that I use as alternative sources. It encompasses: (1) financial constraint data, (2) governance data, and (3) investor sentiment data.

First, since financial constrained firms on average have a higher risk of default (Ogden and Wu 2013; Arnold et al. 2013; Reisel 2014; Molina 2005) and during periods with variations of investor sentiment the cash flows to the firm can be affected, I use two measures of financial constraints in my analysis. First, I use the S&P long term debt ratings as a measure of financial constraint (Almedia, Campello, and Weisbach 2004; Dang and Phan 2016) and second, I use the KZ Index (Kaplan and Zingales 1997) as an alternative measure of financial constraint. The KZ Index is specifically interesting as it is a relative measurement of reliance on external financing. Companies with a higher KZ Index score are more likely to experience difficulties when financial conditions or market conditions tighten since they may have difficulty financing their ongoing operations.

The governance data that I use in this analysis is a constructed measure following prior research on accounting conservatism (Khalifa and Othman 2015; Bill et al. 2013; Ahmed and Duellman 2012; Khan and Watts 2009). I specifically use the C-Score measure as a measure of accounting conservatism instead of the G-Score.

Finally, as an alternative measure of investor sentiment, I use the Michigan Consumer Sentiment Index (MSCI). MSCI is a monthly survey of consumer confidence levels in the US conducted by the University of Michigan. The survey is based on telephone interviews that gather

information on consumer expectations for the overall economy. It considers the people's perception or feeling regarding their current financial health, the health of the economy in the short term, and the prospects for longer-term economic growth. While this measure is not as comprehensive as the Baker and Wurgler (2006) measure, I use this to show that my results are robust to alternate measures of investor sentiment and not specifically driven by how investor sentiment is measured.

CHAPTER 6: RESULTS

The purpose of this section is to provide estimation results and to make inferences about the numerical estimates, hypothesis tests and the statistical significance and sign of the numerical estimates which are part of the analysis of results.

6.1: Univariate Results

The univariate analysis presented in Table 4 shows the difference in the loans, covenants, and other control variables under high and low sentiment periods. To test the relation between investor sentiment and covenant structure, I divide the total sample into three sub-groups based on the estimate of sentiment at the beginning of the loan deal month. The reported summary statistics for high and low sentiment periods in Table 4 have a relatively even split of the data sample. High (Low) sentiment periods are those when the sentiment values are among the top (bottom) tercile group. The difference in means across high and low sentiment periods is reported in the last column of Table 4 with their respective significance levels.

I am primarily interested in the coefficients on the covenant measures. All the three covenant measures: performance covenants, capital covenants and covenant intensity, are significantly positive and statistically different in high sentiment periods compared to the low sentiment periods. It is also important to note that under low (high) sentiment periods, firms raise more (less) of their capital through debt and the $342 Million difference between the sentiment periods is statistically significant. This is also in alignment with the spreads charged on the loans (higher in the low sentiment periods), which has a 47 point statistically different basis. The means for the 3 covenant variables of interest and the difference in means results provide initial support to my *Hypothesis 1*, that banks can see through the investor optimism and put in more covenants

for loans extended during high sentiment periods. This is also because during high sentiment periods, the information asymmetry and agency risks for lenders increase and in order to mitigate such risk, they put in place more covenants. Performance covenant, capital covenant and capital intensity have a statistically significant greater (lower) value in high (low) sentiment periods.

<<Insert Table 4 here<<

Table 4 also provides interesting inferences about the loan and firm characteristics for different sentiment periods. During high sentiment periods, lenders finalize deals with lower loan amounts and less maturity. This is in line with the diversification strategy where they want to reduce the clustering of loans. Moreover, with increased liquidity in the marketplace due to investor exuberance and to have the ability to attract borrowers, lenders reduce their all-in spreads during high sentiment periods. But to protect their money they also put in more performance pricing terms and covenants on the loans extended during high sentiment periods. Also, I find that firms with lower sales, lower cash holdings, higher leverage, higher tangibility, higher return on assets and higher market to book ratio tend to borrow in high sentiment periods.

With regards to covenants violations, I find that all the three measures of likelihood of covenant violations: PVIOL, PVIOL_PCOV and PVIOL_CCOV, are positive and significantly different in the high sentiment periods compared to the low sentiment periods. This provides initial support to my *Hypothesis 2*, that loans made in high sentiment periods have higher likelihood of covenant violations. While the number of observations of the covenant violations decreases relative to my actual covenant data, i.e., 6099 versus 7857, the sample size is still considerably large enough for performing any meaningful analysis. In summary, the univariate results lend preliminary evidence in support of my hypotheses.

6.2: OLS Regression Results

6.2.1 Effect of Macro-economic investor sentiment on debt covenant structure

There is an empirical link between aggregate investments and future cash flows and these future cash flows by themselves are significantly affected by changes in investors perception and feelings (Arif and Lee 2014). As much as these perceptions and feelings of investors do affect future cash flows, and investment peaks during periods of positive sentiment, investing in such firms does not yield superior returns as these positive sentiment periods are followed by lower equity returns (Kumar and Lee 2006; McLean and Zhao 2014; Cai et al. 2013). To analyze the effect of investor sentiment on debt covenant structure, I estimate various OLS models. I am primarily interested in the coefficient on *High Sentiment* in all the models. I expect *High Sentiment* to have a positive and statistically significant coefficient, which entails material assistance to the idea that lending institutions understand the ubiquitous nature of optimism and will strive to extenuate their exposure by placing more covenant restrictions for loans arranged during high sentiment periods.

<<Insert Table 5 Panel A here<<

In Table 5 Panel A, I present the baseline multivariate regression results for the relation between investor sentiment and covenant structure. The dependent variable is performance covenants for columns (1) to (3), capital covenants for columns (4) to (6) and covenant intensity for columns (7) to (9). The variable of interest in all test specifications is *High Sentiment*. Columns (1), (4) and (7) report the results from the estimate of simple linear regression model. Columns (2), (5) and (8) present my baseline regression model's estimation results with lender level clustering.

Columns (3), (6) and (9) present my baseline regression model's estimation results with firm fixed effects and lender level clustering.

There are several past studies that lend evidence to the change in bank lending behavior to changes in the overall investor sentiment or the volatility attributed to the fluctuations of that investor sentiment (Agoraki et al. 2022; Dunz et al. 2021; Cubillas et al. 2021; Cagalyan and Xu 2016; Bushman et al. 2016). The relationship established in these past studies is that during periods of high sentiment, the underlying economic agents create periods of excessive volatility to lending institutions. This volatility transmits its effects through impaired loan amounts and ultimately affecting the bank credit as well as its financial stability causing banks to be more cautious with their lending outcomes.

Consistent with my *Hypothesis 1*, the estimated coefficient of High Sentiment in all the columns (1) to (9) are positive and statistically significant, offering evidence to the fact that lending institutions or banks have an inherent understanding about the sentiment regime under which they are extending loans. The positive relationship between financial covenants and investor sentiment holds after controlling for various loan and firm related characteristics. These results continue to hold even after controlling for firm fixed effects and clustering based on lenders. Columns (3), (6) and (9) report the results of the most restrictive model. The estimated coefficient on High Sentiment indicated that for loans extended during high sentiment periods banks on average place 9 percent more performance covenants, 25 percent more capital covenants and 28 percent more covenant intensity than loans in low sentiment periods[4]. There may be concerns about the

[4] See Table 5 the coefficients for High Sentiment in Column (3), (6) and (9). These coefficients show the percentage increase in covenants. Performance covenants increase by [(exp^(0.085) - 1) = 8.87%]. Capital covenants increase by [(exp^(0.225) - 1) = 25%]. Covenant intensity increases by [(exp^(0.248) - 1) = 28%].

multicollinearity problem in my model. The VIFs, in un-tabulated results, are less than two, suggesting that the results are not subject to any multicollinearity concerns.

6.2.2 Effect of Firm-specific investor sentiment on debt covenant structure

To analyze the effect of firm-specific investor sentiment on debt covenant structure, I estimate various OLS models. I am primarily interested in the coefficient on *Firm Sentiment* in all the models. I expect *Firm Sentiment* to have a positive and statistically significant coefficient, which will be consistent with managers trading off lower loan spread with higher covenants when there is positive firm development resulting in higher firm values during periods of high firm-specific investor sentiment.

<<Insert Table 5 Panel B here<<

In Table 5 Panel B, I present the baseline multivariate regression results for the relation between firm-specific investor sentiment and covenant structure. The dependent variable is performance covenants for columns (1) to (3), capital covenants for columns (4) to (6) and covenant intensity for columns (7) to (9). The variable of interest in all test specifications is *Firm Sentiment*. Columns (1), (4) and (7) report the results from the estimate of simple linear regression model. Columns (2), (5) and (8) present my baseline regression model's estimation results with firm level clustering. Columns (3), (6) and (9) present my baseline regression model's estimation results with firm fixed effects and lender level clustering.

Consistent with my *Hypothesis 1*, the estimated coefficient of *Firm Sentiment* in columns (1) to (6) are positive and statistically significant, offering evidence to the fact that lending institutions lower loan spread with higher covenants when there is positive firm development resulting in higher firm values during periods of high firm-specific investor sentiment. Borrowers,

on the other hand, will also want lower spread and will be willing to accept higher covenants as they will be less concerned about breaching covenants in the future. The positive relationship between financial covenants and investor sentiment holds after controlling for various loan and firm related characteristics. These results continue to hold even after controlling for firm fixed effects and clustering based on lenders. Columns (3), (6) and (9) report the results of the most restrictive model. The estimated coefficient on Firm Sentiment indicates that, for loans extended during high firm-specific sentiment periods, lenders place 18 percent more performance covenants and 28 percent more capital covenants than for loans extended during low firm-specific sentiment periods. Columns (7) to (9) report the results of the impact of firm-specific investor sentiment on covenants intensity. I do not find a consistent relationship between high firm-specific investor sentiment and covenants intensity variable. Since, Covenants intensity as suggested by Bradley and Roberts (2015) is an index variable measuring the degree to which creditors impose restrictions on the actions of the borrowers, this will imply that there is difference in restrictions imposed by lenders when faced with high economy wide investor sentiment and high firm-specific investor sentiment. Further analysis supports this inference. I do find that the number of material restrictions imposed by lenders in the debt contract is significantly lower in the presence of high firm-specific investor sentiment than in the presence of high economy wide investor sentiment.

6.2.3 Effect of Macro-economic investor sentiment on likelihood of covenant violations

To analyze the effect of investor sentiment on the likelihood of covenants violations, I estimate various OLS models. I am primarily interested in the coefficient on *High Sentiment*. I expect *High Sentiment* to have a positive and statistically significant coefficient indicating on average an amplified likelihood of firms violating the covenant restrictions.

<<Insert Table 6 Panel A here<<

In Table 6 Panel A, I present the baseline multivariate regression results for the relation between investor sentiment and likelihood of covenants violations. The dependent variable is the overall likelihood of covenants violation for columns (1) to (3), likelihood of performance covenants violations for columns (4) to (6) and the likelihood of capital covenants violations for columns (7) to (9). The variable of interest in all test specifications is *High Sentiment*. Columns (1), (4) and (7) report the results from the estimate of a simple linear regression model. Columns (2), (5) and (8) present my baseline regression model's estimation results with firm level clustering. Columns (3), (6) and (9) present my baseline regression model's estimation results with firm fixed effects and lender level clustering.

Consistent with my hypothesis 2, the estimated coefficient of *High Sentiment* in all the columns (1) to (9) are positive and statistically significant. The positive relationship between investor sentiment and the likelihood of covenants violations holds after controlling for various loan and firm related characteristics. These results continue to hold even after controlling for firm fixed effects and clustering based on lenders. Columns (3), (6) and (9) report the results of the most restrictive model. The estimated coefficient on *High Sentiment* indicates that for loans extended during high sentiment periods, the overall likelihood of covenant violations is 3 percent greater, the likelihood of performance covenants violations is 1.8 percent greater, and the likelihood of capital covenant violations is 2.3 percent greater than loans in low sentiment periods[5].

[5] See Table 6 the coefficients for High Sentiment in Column (3), (6) and (9). These coefficients show the percentage increase in covenants violations. Overall covenant violations greater by [(exp^(0.029) - 1) = 3%]. Performance covenant violations greater by [(exp^(0.018) - 1) = 1.8%]. Capital covenant violations greater by [(exp^(0.023) - 1) = 2.3%].

6.2.4 Effect of Firm-specific investor sentiment on likelihood of covenant violations

To analyze the effect of firm-specific investor sentiment on the likelihood of covenants violations, I estimate various OLS models. I am primarily interested in the coefficient on *Firm Sentiment*. I expect *Firm Sentiment* to have a negative or insignificant coefficient indicating on average a reduced likelihood of firms violating the covenant restrictions in periods of high firm-specific investor sentiment due to improvement in firm fundamentals.

<<Insert Table 6 Panel B here<<

In Table 6 Panel B, I present the baseline multivariate regression results for the relation between firm-specific investor sentiment and likelihood of covenants violations. The dependent variable is the overall likelihood of covenants violation for columns (1) to (3), likelihood of performance covenants violations for columns (4) to (6) and the likelihood of capital covenants violations for columns (7) to (9). The variable of interest in all test specifications is *Firm Sentiment*. Columns (1), (4) and (7) report the results from the estimate of a simple linear regression model. Columns (2), (5) and (8) present my baseline regression model's estimation results with firm level clustering. Columns (3), (6) and (9) present my baseline regression model's estimation results with firm fixed effects and lender level clustering.

Consistent with my expectation, the estimated coefficient of *Firm Sentiment* in all the columns (1) to (6) are negative and statistically significant. The negative relationship between investor sentiment and the likelihood of covenants violations holds after controlling for various loan and firm related characteristics. These results continue to hold even after controlling for firm fixed effects and clustering based on lenders. These results are consistent with reduced likelihood

of overall violations and performance covenants violations due to positive firm developments which is proxied by the positive media coverage. Columns (3), (6) and (9) report the results of the most restrictive model. The estimated coefficient on *Firm Sentiment* indicates that, for loans extended during high firm specific sentiment periods, the overall likelihood of covenant violations is 7 percent lower, and the likelihood of performance covenants violations is 10 percent lower than for loans extended in low sentiment periods. Columns (7) to (9) report results for likelihood of capital covenant violations in the presence of high firm-specific investor sentiment. The coefficient on *Firm Sentiment* variable is positive and significant which implies that likelihood of capital covenants violation continues to be higher even with positive firm developments. In summary, I show statistical evidence in both Table 5 and Table 6 that lend support to Hypothesis 1 and Hypothesis 2, respectively.

6.3: Investor Sentiment, Debt Covenants and Financial Constraints

The potential mechanisms through which investor sentiment affects the corporate activities of the firm and eventually positions the firms as favorable or unfavorable to raise new capital to finance the investment activities of the firm has been well researched (Kalpan and Zingales 2000; Dang and Xu 2018; Wolfgang and Linde 2011). There is further evidence that firms with a greater number of retail investors as opposed to institutional investors engage in investing less in low-sentiment periods. Especially when these firms are financially constrained, they invest less than the non-financially constrained firms (Polk and Sapienza 2004; McLean and Zhaow 2014; Dang and Xu 2018). Hence analyzing the interaction between investor sentiment and debt contracts subject to the differences between financially constrained and non-constrained firms becomes critically important.

Financially constrained firms have a higher default risk due to their insufficient internal cash flows and lack of access to external financing. In the periods of higher investor sentiment, the expectations for future sales and cash flows increase due to higher investor exuberance and product market optimism. To the extent that higher investor sentiment increases the volatility of future cash flows, it may exacerbate these firms' financial constraints. As such, lenders should be more concerned about the ability to make payments by the financially constrained firms during high investor sentiment periods, leading to stricter debt contracts. Consistent with this discussion, I expect the number of financial covenants to be greater for financially constrained firms amid high investor sentiment.

To examine this relation between investor sentiment and financial covenants conditional on firm financial constraints, I sort the sample into two groups based on whether the issues have investment or noninvestment grade ratings. Following prior literature, I use S&P long term debt ratings as a measure of financial constraint (Almedia, Campello, and Weisbach 2004; Dang and Phan 2016; Gilchrist and Himmelberg 1995). Using S&P long-term debt ratings as a measure of financial constraints is useful since it directly measures the market's assessment of a firm's credit quality. The investment grade subgroup includes issues with S&P rating equal to or higher than BBB-. The non-investment subgroup (financially constrained firms) consists of issues having S&P ratings equal to or lower than BB+. I take the S&P long term debt ratings from Compustat database and merge it with the dealscan database. In my sample, out of 6,444 loan facilities which have S&P long term debt ratings available, 2,293 facilities have investment grades and 4,151 have non-investment grades ratings.

<<Insert Table 10 here<<

Table 10, Table 11 and Table 12 report the results of the impact of higher investor sentiment on financial covenants conditional on financial constraints. I created a dummy variable NINVG which takes a value of 1 for non-investment grade firms and 0 for investment grade firms. I use this variable in Table 10 results. The interaction term between high sentiment and non-investment grade dummy is positive and statistically significant for all three measures of financial covenants. Consistent with my expectations, in terms of financial covenants, I find that high investor sentiment has a positive and significant effect on all the three types of financial covenants for the financially constrained firms compared to investment grade rated firms. This evidence suggests that financially constrained firms are faced with more restrictive loan covenants in periods of high investor sentiment. This finding is consistent with lender's ability to see through investor exuberance and putting in more covenants for financially constrained firms compared to investment grade firms in periods of high investor sentiment.

Additionally, I use an alternate measure of financial constraint, the results of which are depicted in Table 11. The KZ Index (Kaplan and Zingales 1997) as an alternative measure of financial constraints is used to check the robustness of my results. I follow Kaplan and Zingales (1997) and Lamont et al. (2001) in constructing the KZ Index. The KZ Index is calculated as.

$$\mathrm{KZ} = 0.283\mathrm{Q} - \frac{1.002\mathrm{CF}}{\mathrm{K}} + \frac{3.139\mathrm{Debt}}{\mathrm{Capital}} - \frac{39.368\mathrm{Div}}{\mathrm{K}} - 1.315\mathrm{Cash/K} \qquad (9)$$

Where,

$$Q = \frac{[Total\ Assets\ (AT) - Common\ Equity\ (ceq) - Deferred\ Tax\ (txdb) + Fiscal\ Year\ End\ Price\ (prcc\_f) * Common\ Chares\ Oustanding\ (csho)]}{Property\ Pland\ and\ Equipment\ (ppent)} \qquad (10)$$

$$\frac{CF}{K} = \frac{[Income\ Before\ Extraordinary\ Items\ (ib) + Depreciation\ (dp)]}{Lagged\ ppent} \quad (11)$$

$$\frac{Debt}{Capital} = \frac{[\text{long} - \text{term debt (dltt} + \text{debt in current liabilities(dlc)}]}{[\text{dltt} + \text{dlc} + \text{stockholder's equity(seq)}]} \quad (12)$$

$$\frac{Div}{K} = \frac{[Dividends\ Common\ (dvc) + Dividends\ Preferred\ (dvp)]}{Lagged\ ppent} \quad (13)$$

$$\frac{Cash}{K} = \frac{Cash\ Holdings\ and\ Short\ Term\ Investments\ (che)}{Lagged\ ppent} \quad (14)$$

<<Insert Table 11 here<<

Table 11 reports the results of the impact of higher investor sentiment on financial covenants conditional on financial constraints based on KZ Index. The financially constrained (financially unconstrained) subsample includes firm-year observations whose KZ Index is above (below) the sample median. The interaction term between high sentiment and non-investment grade dummy is positive and significant for all three measures of financial covenants – performance covenants, capital covenants and covenant intensity.

6.4: Investor Sentiment, Debt Covenants and Corporate Governance

Biddle et al. (2022) finds that unconditional and conditional accounting conservatism helps lower bankruptcy risk. Donovan et al. (2015) examines the relation between accounting conservatism and creditor recovery rates for firms in default and finds that creditors of firms with more conservative accounting before default have significantly higher recovery rates.

Prior literature finds lenders benefits from firms conservative accounting policies. To the extent, conservative accounting policies attenuate the default risk, it is also likely to moderate the positive impact of higher investor sentiment on debt covenants. As such, lenders should be less concerned about the payment ability of firms following conservative financial policies amid high investor sentiment periods, resulting in a reduced demand for monitoring by lenders. Consistent with this discussion, I expect the number of financial covenants to be greater for firms which follow aggressive accounting policies amid high investor sentiment.

To examine the relation between investor sentiment and financial covenants conditional on accounting conservatism, I sorted the sample into two groups based on whether the issues have higher than or lower than median conservatism score. Following prior literature, I use C-Score as a measure of accounting conservatism. C-Score is the firm-specific timeliness score developed by Khan and Watts (2009).

In the Khan and Watts (2009) model, G-Score denotes a firm-specific estimation of the timeliness of good news and C-Score denotes firm-specific timeliness of bad news. They provide evidence consistent with conservatism increasing in the C-Score value. The equations to estimate G-Score and C-Score are as follows:

$$\mathrm{NI} = \beta_1 + \beta_2 \mathrm{Dt} + \beta_3 \mathrm{Returnt} + \beta_4 \mathrm{Dt} * \mathrm{Returnt} + \varepsilon \quad (15)$$

$$\mathrm{G-Scoret} = \beta_3 = \mu 1 + \mu 2 \mathrm{MVEt} + \mu 3 \mathrm{MTBt} + \mu 4 \mathrm{Leveraget} + \varepsilon \quad (16)$$

$$\mathrm{C-Scoret} = \beta_4 = \alpha 1 + \alpha 2 \mathrm{MVEt} + \alpha 3 \mathrm{MTBt} + \alpha 4 \mathrm{Leveraget} + \varepsilon \quad (17)$$

Where MVE is the log of the market value of equity; MTB is market value of equity divided by book value of equity at the end of the fiscal year; Leverage is the total debt divided by total

assets at the end of the fiscal year. Replacing β3 from equation (16) and β4 from equation (17) into regression equation (15) yields:

$$NIt = \beta 1 + \beta 2Dt + Returnt * (\mu 1 + \mu 2MVEt + \mu 3MTBt + \mu 4Leveraget) + Dt * Returnt * (\alpha 1 + \alpha 2MVEt + \alpha 3MTBt + \alpha 4Leveraget) + (\delta 1MVEt + \delta 2MTBt + \delta 3Leveraget + \delta 4D * MVEt + \delta 5D * MTBt + \delta 6D * Leveraget) + \varepsilon \quad (18)$$

I estimate equation (18) using annual cross-sectional regressions. I estimate the coefficients from equation (18) and apply it to equation (17) to calculate the firm-specific conservatism measure, C-Score. Firm-specific conservatism is increasing in the value of C-Score.

<<Insert Table 13 here<<

Table 13 reports the results of the impact of higher investor sentiment on financial covenants conditional on firm's accounting policies. I create a dummy variable NGC which takes a value of 1 for firms with C-Score values below the sample median and 0 for firms with C-Score values above the sample median. The interaction term between high sentiment and aggressive accounting dummy is positive and significant for all capital covenants and covenants intensity measures of financial covenants. In terms of performance covenants, the interaction term has a positive but insignificant coefficient. Consistent with my expectations, in terms of financial covenants, I find that higher investor sentiment has a positive and significant effect on financial covenants for the firms following aggressive accounting policies compared to firms with conservative accounting policies. This evidence suggests that firms with aggressive accounting policies are faced with more restrictive loan covenants in periods of high investor sentiment. The evidence that I find is consistent with Hamdani et al. (2022) who show that covenants are adversely affected in firms with aggressive accounting practices. In addition to this, they also show that the net worth of such firms is significantly affected. They also state that this could have significant

implications for capital raising activities and poses certain challenges when it comes to raising more capital in terms of issuing new equity.

6.5: Investor Sentiment, Cost of Debt and Debt Covenants

In this section, I examine the relation among investor sentiment, cost of debt and debt covenants. Prior research focuses on the agency problem mitigating effects of covenants and their relationship to the cost of debt; the design of covenants and how it reduces the adverse effect of poor accounting quality and eventually the cost of debt; the increase in bankruptcy risk due to restrictive covenants; and the role of debt covenants and conservative financial accounting in addressing agency problems and minimizing agency cost (Mansi et al. 2021; Zhang et al. 2018; Yang et al. 2017; Spceland et al. 2016; Reisel 2014; Beaty et al. 2012; Mansi et al. 2009; Qiu and Yu 2009; Guay 2008). All these prior studies examine the likelihood of joint determination of the cost of debt and the covenant structure or covenant terms.

While the focus of this analysis is not to disentangle the implications on cost of debt, however, since the cost of debt and debt covenants could be jointly determined, I examine the relation among investor sentiment, cost of debt and debt covenants by estimating a system of simultaneous equations that allows for a joint determination of cost of debt and debt covenants. The specifications for my simultaneous equation model have the following form as depicted in equation (19) and (20) below.

$$Ln\,(Spread)_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln(Deal\ Amount)_{it} + \beta_3 Ln(Maturity)_{it} + \beta_4 Collateral_{it} + \beta_5 Performance\ Pricing_{it} + \beta_6 Sales_{it-1} + \beta_7 Leverage_{it-1} + \beta_8 GSD_{it} + \beta_9 ROA_{it-1} + \beta_{10} Cash\ Holding_{it-1} + \varepsilon_{it} \quad (19)$$

$$Financial\ Covenant\ Intensity_{it}$$
$$= \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln(Deal\ Amount)_{it} + \beta_3 Ln(Maturity)_{it}$$
$$+ \beta_4 Collateral_{it} + \beta_5 Performance\ Pricing_{it} + \beta_6 Sales_{it-1}$$
$$+ \beta_7 Leverage_{it-1} + \beta_8 Tangibility_{it-1} + \beta_9 ROA_{it-1} + \beta_{10} Cash\ Holding_{it-1}$$
$$+ \varepsilon_{it} \quad (20)$$

<<Insert Table 14 Panel A here<<

Table 14 Panel A reports the estimation results of the simultaneous regressions. The dependent variable is Ln (Spread) for columns (1), (3) and (5), performance covenants for column (2), capital covenants for column (4) and covenant intensity for column (6). The variable of interest in all test specifications is *High Sentiment*.

Consistent with my hypothesis 1, the estimated coefficient of *High Sentiment* for all the measures of covenants are positive and statistically significant. In addition, the Ln (Spread) coefficient is negative and significant in joint determination with different covenant measures. This is consistent with lenders not being able to price-protect themselves during periods of high investor exuberance and resorting to alternative monitoring mechanisms (covenants) to create opportunities to renegotiate with the borrowers, should the optimistic projections be not realized later.

<<Insert Table 14 Panel B here<<

The estimation results of the simultaneous regressions are presented in Table 14, Panel B. The dependent variable differs across columns, with Ln (Spread) being the dependent variable in columns (1), (3), and (5), performance covenants in column (2), capital covenants in column (4),

and covenant intensity in column (6). The variable of interest in all test specifications is *Firm Sentiment.*

Consistent with the first hypothesis, the estimated coefficient of *Firm Sentiment* for all covenant measures is positive and statistically significant. This finding supports the notion that during periods of high firm-specific investor sentiment, lending institutions trade off lower loan spreads for higher covenants. This behavior is observed when positive firm developments lead to higher firm values. Furthermore, the coefficient of Ln (Spread) is negative and significant when jointly determined with different covenant measures. This consistency aligns with the notion that lending institutions are willing to accept lower loan spreads while implementing higher covenants during periods characterized by high firm-specific investor sentiment. Conversely, borrowers also seek lower spreads and are willing to accept higher covenant levels, as they become less concerned about breaching covenants in the future.

6.6: Investor Sentiment, Debt Covenants and Debt Maturity

From the perspective of lenders, short-maturity debt offers a significant advantage by granting them control rights ex post, enabling effective borrower monitoring. Incomplete debt contracts typically do not provide lenders with control rights over all future contingencies at the outset. However, the use of short-maturity debt addresses this limitation by affording lenders better protection and increased bargaining power. Lenders can leverage the threat of rejecting refinancing when short-term debt comes up for renewal (Giannetti 2003). In essence, the frequent renegotiations and renewals associated with short-maturity debt serve to fill the gaps of contractual incompleteness, thereby allocating control rights to lenders ex post (Roberts, 2015; Roberts & Sufi, 2009).

Existing research consistently highlights that short-maturity debt subjects' managers to more frequent and rigorous creditor monitoring (Datta et al. 2005; Stulz 2001). Graham et al. (2008) demonstrate that banks tend to reduce the maturity of loans provided to firms with a history of financial misreporting, suggesting that short-term debt is utilized by lenders to enhance managerial scrutiny and information gathering in an environment characterized by heightened risk and information asymmetry. Furthermore, Gul and Goodwin (2010) emphasize the significance of short-maturity debt in improving corporate transparency, particularly for risky firms.

Given the constant need for renegotiation and rollover, lenders perceive shorter maturity debt as less risky than long-maturity debt. If lenders are concerned about excessive optimism caused by high investor sentiment, they are likely to prefer providing short-maturity loans and/or imposing more stringent covenants on long-term debt compared to short-term debt. This serves as a precautionary measure to mitigate the potential risks associated with heightened investor sentiment. Considering investor sentiment as a determining factor in debt contract design, its influence is expected to be more pronounced in long-term debt compared to short-term debt. Thus, empirically, the impact of investor sentiment is anticipated to have a stronger effect on long-term debt.

<<Insert Table 15 Panel A, B, C here<<

Table 15 report the results of the impact of investor sentiment on covenants categorized by loan maturity. The dependent variable is performance covenants in panel A, capital covenants in panel B and covenants intensity in panel C. The variable of interest in all three panels is High Sentiment. To examine this relationship, I divide the sample into groups based on the maturity of

the loans at the time of contract inception, specifically one-year, three-year, and five-year loan maturities.

Consistent with my expectations, I find that the impact of higher investor sentiment on performance covenants and covenants intensity is more pronounced in long-term debt compared to short-term debt as shown in panel A and panel C of Table 15. For capital covenants, as shown in panel B of Table 15, the results indicate that high investor sentiment affects both short-term and long-term debt in a similar manner. This suggests that lenders demand borrowers to maintain specified capital and net worth values even for loans with short-term maturities in the presence of high investor sentiment.

6.7: Robustness Checks and Additional Analyses

I run a battery of robustness checks and summarize the main findings in this section

6.6.1 Alternative measures of investor sentiment

I use the monthly consumer confidence index constructed by the Michigan consumer research center as an alternative measure of investor sentiment. This measure is based on a survey that grades respondents' perceptions of financial well-being, state of the economy and general consumer spending on a scale of one to five, and generates a monthly score based on a linear combination of the responses.

<<Insert Table 9 here<<

I re-run the financial covenants intensity regressions with consumer confidence index as an alternative measure of investor sentiment. The results reported in Table 9 indicate that the relation between investor sentiment and financial covenant intensity is positive and significant for

all three measures of financial covenant intensity. This is consistent with my results in Table 5, lending justification that my main results are robust to how the investor sentiment measure is defined.

6.6.2 Alternative measure of financial constraint

In addition to the results that I presented earlier in Table 10 and Table 11, I also use firm size as a measure of financial constraint. I run regressions on performance covenant, capital covenant and covenant intensity by including a variable that identifies the small firms and interacts that variable with the high sentiment. These results are shown in Table 12, and they are inconsistent with the results from Table 10 and 11. I am interested in the interaction between the high sentiment variable and the small firm indicator variable.

<<Insert Table 12 here<<

The interaction term between high sentiment and the small firm indicator variable is positive and statistically significant for the capital covenants but is negative and insignificant for the performance covenant. Additionally, the coefficient is negative and statistically significant for the covenant intensity measures. Though the evidence from this table is inconsistent, this does not necessarily mean the non-existence of an explanatory linkage between financially constrained firms and loan covenants. This only implies that firm size is not an effective measure to use in identifying financially constrained firms. There are several past studies that draw conclusions to the same finding and the irrelevance and limitation of using firm size as an indicator of financial constraint (Yang et al. 2022; Beck et al. 2008; Cabral and Mata 2003; Kadapakkam et al. 1998). In summary I conclude that the findings from Table 10 and Table 11 are robust and show evidence of the interaction between covenants and financially constrained firms.

CHAPTER 7: CONCLUSION

Debt, specifically private debt is one of the most important sources of financing for the U.S. firms. Covenants are a very important contract term through which creditors seek protection and recourse. In addition, prior literature shows that violation of these debt covenants are significant events: which results in significant restructuring and refinancing costs, renegotiations on the debt, reduced corporate investments, higher CEO turnover and material restrictions being placed on dividend payouts, etc. The purpose of this study is to examine the effects of investor sentiment on loan spread and financial covenants in debt contracts and on the ex-ante likelihood of covenant violations.

Based on the evidence presented in this research, I argue that high investor sentiment exacerbates information risk and agency problems in debt contracting. The presence of high investor exuberance increases risks faced by lenders and therefore increases the intensity and tightness of covenants in debt contracts. In turn, this also increases the ex-ante likelihood of covenant violations.

The results presented in the paper are robust to alternative measures of investor sentiment i.e., Michigan consumer confidence index. In addition, I find that the positive relation between investor sentiment and debt covenants is more pronounced for financially constrained firms and for firms that exhibit a lower degree of timelier recognition of economic losses in accounting earnings. My evidence adds to the sentiment literature by highlighting the importance of investor sentiment in debt contracting.

APPENDIX

Variable Definitions and Sources

Variable	Description	Source(s)
Sales	Total sales of a firm	Compustat
Total Assets	Natural logarithm of total assets of the firm	Compustat
Leverage	Leverage ratio calculated as total debt/assets	Compustat
Current	Current ratio	Compustat
Tangibility	Ratio of net property, plant, and equipment to total assets	Compustat
Return on Assets	Ratio of EBITDA to total assets	Compustat
Cash Holding	Ratio of cash and short-term investments to total assets	Compustat
Market to Book Ratio	Market to book ratio. Ratio of (book value of assets - book value of equity + market value of equity) to book value of assets	Compustat
Performance Covenants	The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA	Dealscan
Capital Covenants	The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement	Dealscan
Covenant Intensity	An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements	Dealscan
Financial Covenants	Total number of financial covenants in a loan facility	Dealscan

Deal Amount	Natural logarithm of loan deal amount	Dealscan
Maturity	Natural logarithm of maturity (measured in months) of a loan	Dealscan
Collateral	Variable takes the value of 1 (0) for loans which are secured (otherwise)	Dealscan
Performance Pricing	Variable takes the value of 1(0) if the loan contains a performance pricing grid (otherwise)	Dealscan
PVIOL	Aggregate probability of covenant violation (at the loan inception date) across all covenants included on a given loan package from the total set of fifteen covenant categories as outlined in Demerjian and Owens (2016)	Peter Demerjian Personal Website
PVIOL_PCOV	Aggregate probability of covenant violation (at the loan inception date) across all performance covenants included on a given loan package, where performance covenants include (1) Min. cash interest coverage, (2) Min. debt service coverage, (3) Min. EBITDA, (4) Min. fixed charge coverage, (5) Min. interest coverage, (6) Max. debt-to-EBITDA, and (7) Max. senior debt-to-EBITDA	Peter Demerjian Personal Website
PVIOL_PCOV	Aggregate probability of covenant violation (at the loan inception date) across all capital covenants included on a given loan package, where capital covenants include (1) Min. quick ratio, (2) Min. current ratio, (3) Max. debt-to-equity, (4) Max. debt-to-tangible net worth, (5) Max. leverage, (6) Max. senior leverage, (7) Min. net worth, and (8) Min. tangible net worth	Peter Demerjian Personal Website

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TABLE 1: Sample Selection and Distribution by Industry and Year

Panel A: Sample Selection

Number of Facilities available in Dealscan from 1996 to 2017	270,204
Less: Loan to Non -US Firms and Non-US Currency Deals	152,551
US Dollar denominated Loans	117,653
Less:	
Base Rate Spread is not based on LIBOR	23,031
All-in-spread and Deal Amount is missing or zero	996
Loans to Financial and Regulated Industries	18,795
Facilities with incomplete Financial data in Compustat	51,395
Number of Facilities in the Final Sample	23,436

Panel B: Sample Distribution by Industry Classification

Industry	N	%
Business Equipment	1877	8.01
Chemical and Allied Products	909	3.88
Consumer Durables	3577	15.26
Consumer Nondurables	1589	6.78
Energy	806	3.44
Healthcare, Medical Equip., and Drugs	3009	12.83
Manufacturing	1500	6.40
Telephone and Television	3596	15.35
Wholesale, Retail and Some Services	1888	8.06
Other	4685	19.99
Total	23436	100

Table 1: Contd.

Panel C: Sample Distribution by Year

Deal Year	Number of Companies	Number of Packages	Number of Facilities
1996	885	970	1,440
1997	1,106	1,210	1,828
1998	920	1,033	1,737
1999	822	904	1,601
2000	730	792	1,290
2001	753	814	1,259
2002	805	861	1,254
2003	806	876	1,283
2004	954	1,036	1,525
2005	891	998	1,498
2006	758	888	1,294
2007	695	979	1,436
2008	462	610	832
2009	339	477	620
2010	409	716	992
2011	334	630	919
2012	297	500	781
2013	269	407	687
2014	218	294	516
2015	233	286	446
2016	98	114	166
2017	19	19	32
Total	12,803	15,414	23,436

TABLE 2: Summary Statistics

Table 2 reports the summary statistics for the variable used in the study. The sample period is from 1996 to 2017.

Variables	N	Mean	SD	P25	P50	P75
Investor Sentiment	23436	0.19	0.6994	-0.22	0.30	0.46
Firm Sentiment	11948	0.64	0.1593	0.53	0.64	0.74
Log_Spread	23432	5.20	0.6792	4.83	5.30	5.66
Deal Amount	23436	633.85	983.9905	90.00	265.00	746.67
Maturity	23259	46.80	22.4529	33.00	51.00	60.00
All-in-Spread	23436	219.86	127.8510	125.00	200.00	287.50
Collateral	23436	0.71	0.4553	0.00	1.00	1.00
Performance Pricing	23436	0.49	0.4998	0.00	0.00	1.00
Performance Covenants	23436	1.75	0.9688	1.00	2.00	2.00
Capital Covenants	23436	0.56	0.7764	0.00	0.00	1.00
Financial Covenants	23436	2.04	0.9424	1.00	2.00	3.00
Covenant Intensity	23436	2.88	1.8843	1.00	3.00	5.00
Sales	22836	2669.25	6011.5780	212.80	687.56	2213.40
Leverage	22864	0.34	0.2591	0.15	0.30	0.48
Current	22094	1.93	1.2627	1.14	1.63	2.33
Tangibility	22836	0.31	0.2407	0.11	0.24	0.45
Return on Assets	22759	0.14	0.0890	0.09	0.13	0.18
Cash Holding	22915	0.09	0.1128	0.01	0.04	0.11
Market to Book Ratio	19723	1.79	1.0483	1.16	1.48	2.02
PVIOL	18706	0.40	0.4215	0.02	0.16	0.93
PVIOL_PCOV	18706	0.36	0.4137	0.01	0.10	0.88
PVIOL_CCOV	18706	0.09	0.2439	0.00	0.00	0.03

TABLE 3: Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10
Log_Spread	1.0000									
Deal Amount	-0.2070	1.0000								
Maturity	0.0100	0.2730	1.0000							
All-in-Spread	1.0000	-0.2070	0.0100	1.0000						
Collateral	0.5860	-0.2290	0.0910	0.5860	1.0000					
Performance Pricing	-0.2980	0.0460	0.1900	-0.2980	-0.1980	1.0000				
Performance Covenants	0.1920	-0.0080	0.1890	0.1920	0.2160	0.0350	1.0000			
Capital Covenants	-0.1780	-0.3240	-0.2240	-0.1780	-0.0900	0.0590	-0.2350	1.0000		
Financial Covenants	0.1040	-0.1420	0.0870	0.1040	0.1700	0.0460	0.8220	0.1850	1.0000	
Covenant Intensity	0.5180	-0.1150	0.1270	0.5180	0.6510	-0.1050	0.4940	-0.1090	0.4340	1.0000
Sales	-0.3220	0.7320	0.0660	-0.3220	-0.3860	0.0790	-0.1820	-0.2500	-0.2940	-0.3190
Leverage	0.2640	0.1300	0.0740	0.2640	0.2180	-0.0780	0.1610	-0.1420	0.1000	0.2530
Current	-0.0670	-0.1550	0.0250	-0.0670	-0.0020	0.0160	0.0140	0.1090	0.0610	-0.0110
Tangibility	-0.0190	0.0350	-0.0180	-0.0190	-0.0160	0.0090	-0.0710	0.1220	0.0050	-0.0330
Return on Assets	-0.2950	0.1050	0.0680	-0.2950	-0.2180	0.1110	0.0490	-0.0150	0.0310	-0.1390
Cash Holding	-0.0200	0.0050	0.0480	-0.0200	-0.0510	0.0080	-0.0430	-0.0850	-0.0740	-0.0840
Market to Book Ratio	-0.2800	0.1350	0.0760	-0.2800	-0.1920	0.0890	0.0280	-0.0740	0.0120	-0.1270
PVIOL	0.3840	-0.3230	-0.1020	0.3840	0.3550	-0.1220	0.2650	0.1460	0.3070	0.3490
PVIOL_PCOV	0.4120	-0.2540	-0.0450	0.4120	0.3610	-0.1150	0.3740	-0.0660	0.3190	0.3870
PVIOL_CCOV	-0.0250	-0.3730	-0.2000	-0.0250	0.0580	0.0130	-0.0920	0.8610	0.2110	0.0040
Investor Sentiment	-0.1111	-0.1430	-0.1058	-0.1030	-0.0250	0.0025	0.0222	0.2009	0.1000	0.0295
Firm Sentiment	-0.1116	0.0049	-0.0197	-0.1016	-0.0779	0.0455	0.0195	0.0740	0.0500	-0.0472

Table 3: Contd.

Variables	11	12	13	14	15	16	17	18	19	20	21	22
Sales	1.0000											
Leverage	0.0120	1.0000										
Current	-0.1560	-0.2980	1.0000									
Tangibility	0.0010	0.2040	-0.2820	1.0000								
Return on Assets	0.1000	-0.1150	0.0380	0.1230	1.0000							
Cash Holding	0.0490	-0.3310	0.3230	-0.2400	0.0430	1.0000						
Market to Book Ratio	0.0220	-0.1720	0.0480	-0.1160	0.4790	0.2550	1.0000					
PVIOL	-0.3560	0.3200	-0.1050	0.0440	-0.3790	-0.1570	-0.2830	1.0000				
PVIOL_PCOV	-0.2890	0.3420	-0.0980	-0.0060	-0.3810	-0.1380	-0.2830	0.9020	1.0000			
PVIOL_CCOV	-0.3500	-0.0370	0.0640	0.1210	-0.0690	-0.1150	-0.1250	0.3400	0.0830	1.0000		
Macro Sentiment	-0.0665	0.0270	-0.0140	0.0368	0.0118	-0.0796	-0.0021	0.0785	0.0524	0.0956	1.0000	
Firm Sentiment	0.0389	-0.0799	-0.0272	-0.0752	0.1415	0.0445	-0.0171	-0.0853	-0.0946	-0.0026	0.0797	1.0000

TABLE 4: Univariate Tests

Variables	Sentiment = High			Sentiment = Low			Difference in Means
	N	Mean	SD	N	Mean	SD	
Deal Amount	7,857	435.16	759.1433	7,925	776.87	1,078.6800	-341.71***
Maturity	7,789	44.35	24.4890	7,877	47.56	20.2385	-3.21***
All-in-Spread	7,857	200.55	114.1018	7,925	247.09	131.6768	-46.54***
Collateral	7,857	0.70	0.4569	7,925	0.71	0.4547	-0.0049
Performance Pricing	7,857	0.51	0.5000	7,925	0.47	0.4989	0.0409***
Performance Covenants	7,857	1.80	1.0189	7,925	1.69	0.9433	0.1122***
Capital Covenants	7,857	0.86	0.8896	7,925	0.37	0.6220	0.4932***
Financial Covenants	7,857	2.24	0.9621	7,925	1.89	0.9160	0.3494***
Covenant Intensity	7,857	3.00	1.8862	7,925	2.70	1.8870	0.304***
Sales	7,585	1869.61	4689.5970	7,790	3401.02	7,076.6140	-1531.41***
Leverage	7,618	0.36	0.2623	7,779	0.33	0.2533	0.027***
Current	7,311	1.91	1.2433	7,572	1.93	1.2296	-0.0195
Tangibility	7,602	0.33	0.2355	7,770	0.30	0.2437	0.0288***
Return on Assets	7,559	0.14	0.0919	7,776	0.13	0.0853	0.004***
Cash Holding	7,632	0.07	0.1080	7,796	0.09	0.1110	-0.0223***
Market to Book Ratio	6,427	1.81	1.1107	6,826	1.68	0.9717	0.1218***
PVIOL	6,099	0.46	0.4228	6,567	0.36	0.4141	0.0955***
PVIOL_PCOV	6,099	0.39	0.4175	6,567	0.33	0.4077	0.0587***
PVIOL_CCOV	6,099	0.13	0.2903	6,567	0.06	0.2063	0.0714***

*** p<0.01, ** p<0.05, * p<0.1

TABLE 5: Investor Sentiment and Debt Covenants

Panel A: The Effect of Investor Sentiment on Debt Covenants

Variables	Performance Covenants			Capital Covenants			Covenant Intensity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High Sentiment	0.112***	0.189***	0.085**	0.493***	0.312***	0.225***	0.304***	0.563***	0.248***
	(4.40)	(7.49)	(2.83)	(26.84)	(17.26)	(7.84)	(6.05)	(14.21)	(3.47)
Ln (Spread)		0.254***	0.177***		-0.204***	-0.132***		0.688***	0.544***
		(11.56)	(7.15)		(-11.27)	(-10.04)		(19.42)	(15.44)
Ln (Deal Amount)		0.063***	0.080**		-0.177***	-0.156***		0.156***	0.196***
		(5.49)	(3.12)		(-22.70)	(-9.70)		(8.28)	(4.39)
Ln (Maturity)		0.226***	0.074***		-0.098***	-0.03*		0.167***	-0.004
		(13.43)	(6.85)		(-7.36)	(-2.27)		(6.40)	(-0.20)
Collateral		0.169***	0.041		-0.0387	-0.080***		1.864***	1.613***
		(6.31)	(1.43)		(-1.60)	(-3.98)		(39.40)	(23.38)
Performance Pricing		0.212***	0.112***		-0.005	0.039**		0.258***	0.119**
		(9.67)	(5.46)		(-0.34)	(2.66)		(7.36)	(3.23)
Sales		-0.000***	-0.000***		0.000	-0.000***		-0.000***	-0.000***
		(-7.06)	(-5.28)		(1.42)	(-5.17)		(-4.92)	(-6.67)
Leverage		0.439***	-0.111		-0.411***	-0.198***		0.666***	0.081
		(6.37)	(-1.13)		(-11.22)	(-4.62)		(6.76)	(0.66)
Tangibility		-0.380***	0.193		0.322***	-0.117		-0.440***	0.845**
		(-6.18)	(1.43)		(6.90)	(-1.38)		(-4.83)	(2.79)
ROA		1.285***	0.682**		-0.620***	0.403***		1.143***	0.351
		(8.94)	(3.21)		(-6.02)	(3.41)		(5.38)	(1.23)
Cash Holding		-0.414**	-0.166		-0.112	-0.228		-0.539**	-0.587*
		(-3.16)	(-0.76)		(-1.26)	(-1.84)		(-2.83)	(-2.52)
Constant	1.689***	-1.193***	-0.0411	0.369***	3.000***	2.286***	2.698***	-4.057***	-2.443***
	(83.07)	(-8.17)	(-0.19)	(29.23)	(26.49)	(17.68)	(63.53)	(-18.19)	(-6.42)
Observations	15782	14959	13891	15782	14959	13891	15782	14959	13891
R-squared	0.030	0.176	0.720	0.090	0.275	0.779	0.033	0.462	0.789
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 5 Panel A reports the regression results of the effect of investor sentiment on debt covenants. This table provides estimates of the following model:

$$\begin{aligned} &Financial\ Covenant\ Intensity_{it} \\ &\quad = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} \\ &\quad + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

Panel B: The Effect of Firm Investor Sentiment on Debt Covenants

Variables	Performance Covenants			Capital Covenants			Covenant Intensity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Firm Sentiment	0.107**	0.168***	0.166***	0.289***	0.219***	0.246***	-0.546***	0.171**	0.056
	(0.050)	(0.049)	(0.048)	(0.036)	(0.034)	(0.030)	(0.106)	(0.082)	(0.091)
Ln (Spread)		0.109***	0.0219		-0.136***	-0.0779***		0.474***	0.231***
		(0.015)	(0.014)		(0.010)	(0.009)		(0.025)	(0.026)
Ln (Deal Amount)		-0.00964	-0.0267***		-0.106***	-0.112***		0.0248**	0.0581***
		(0.007)	(0.009)		(0.004)	(0.005)		(0.011)	(0.016)
Ln (Maturity)		0.160***	0.0631***		-0.137***	-0.0669***		-0.0296	-0.130***
		(0.014)	(0.012)		(0.010)	(0.007)		(0.023)	(0.022)
Collateral		0.143***	-0.0543**		-0.0648***	-0.0318**		2.001***	1.570***
		(0.020)	(0.021)		(0.014)	(0.013)		(0.034)	(0.040)
Performance Pricing		0.106***	0.0848***		-0.0173	0.0137		0.130***	0.0589**
		(0.016)	(0.014)		(0.011)	(0.008)		(0.027)	(0.026)
Sales		-0.000***	-0.000***		0.000	-0.000***		-0.000***	-0.000***
		(-7.06)	(-5.28)		(1.42)	(-5.17)		(-4.92)	(-6.67)
Leverage		0.354***	-0.248***		-0.231***	-0.0706**		0.665***	0.157
		(0.040)	(0.056)		(0.028)	(0.035)		(0.067)	(0.105)
Tangibility		-0.347***	-0.0567		0.420***	0.331***		-0.456***	0.496**
		(0.034)	(0.116)		(0.023)	(0.072)		(0.056)	(0.218)
ROA		1.048***	0.195		-0.553***	0.262***		0.543***	0.122
		(0.098)	(0.132)		(0.067)	(0.082)		(0.163)	(0.248)
Cash Holding		-0.457***	-0.1		-0.198***	-0.384***		-0.803***	-0.339*
		(0.074)	(0.108)		(0.051)	(0.067)		(0.124)	(0.202)
Constant	1.562***	0.250**	1.489***	0.200***	2.149***	1.508***	2.867***	-1.409***	0.444**
	(0.033)	(0.097)	(0.105)	(0.023)	(0.067)	(0.065)	(0.069)	(0.162)	(0.196)
Observations	11948	11631	11631	11948	11631	11631	11948	11631	11631
R-squared	0.001	0.106	0.69	0.005	0.157	0.76	0.002	0.445	0.756
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 5 Panel B reports the regression results of the effect of firm investor sentiment on debt covenants. This table provides estimates of the following model:

$$\begin{aligned} &Financial\ Covenant\ Intensity_{it} \\ &\quad = \beta_0 + \beta_1 Firm\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} \\ &\quad + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is Firm Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

TABLE 6: Investor Sentiment and Likelihood of Covenant Violation

Panel A: The Effect of Investor Sentiment on Likelihood of Covenant Violation

Variables	PVIOL			PVIOL_PCOV			PVIOL_CCOV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High Sentiment	0.096***	0.071***	0.029**	0.059***	0.047***	0.018*	0.071***	0.050***	0.023***
	(7.87)	(6.42)	(2.89)	(4.95)	(4.34)	(2.01)	(10.23)	(6.58)	(3.67)
Ln (Spread)		0.082***	0.060***		0.093***	0.067***		-0.006	-0.004
		(7.85)	(5.00)		(8.99)	(5.54)		(-0.94)	(-1.15)
Ln (Deal Amount)		-0.047**	-0.034***		-0.036***	-0.026***		-0.026***	-0.014*
		(-10.81)	(-4.29)		(-8.30)	(-3.80)		(-7.11)	(-2.55)
Ln (Maturity)		-0.021**	0.011		-0.011	0.009		-0.014**	-0.001
		(-2.94)	(0.97)		(-1.49)	(1.00)		(-2.69)	(-0.03)
Collateral		0.075***	0.049***		0.059***	0.038*		0.031***	0.016*
		(5.82)	(3.67)		(4.67)	(2.56)		(3.95)	(2.13)
Performance Pricing		-0.004	-0.01		0.000	-0.007		-0.003	-0.002
		(-0.43)	(-1.24)		(0.01)	(-0.94)		(-0.53)	(-0.37)
Sales		0.000	-0.000***		0.000	-0.000***		0.000	-0.000**
		(0.38)	(-4.93)		(0.48)	(-3.54)		(0.91)	(-3.07)
Leverage		0.399***	0.327***		0.405***	0.329***		0.058**	0.088**
		(13.90)	(11.34)		(14.19)	(10.18)		(3.15)	(2.88)
Tangibility		0.008	-0.067		-0.061**	-0.030		0.105***	0.003
		(0.35)	(-0.74)		(-2.67)	(-0.34)		(5.56)	(0.08)
ROA		-1.284***	-1.269***		-1.297***	-1.444***		-0.295***	-0.029
		(-19.79)	(-17.14)		(-20.04)	(-21.25)		(-6.46)	(-0.55)
Cash Holding		-0.126*	-0.166		-0.137*	-0.0689		0.0511	-0.086
		(-2.11)	(-1.65)		(-2.32)	(-0.77)		(1.26)	(-1.58)
Constant	0.364***	0.268***	0.313***	0.335***	0.11	0.199**	0.061***	0.252***	0.155***
	(37.14)	(4.15)	(5.04)	(34.74)	(1.70)	(3.14)	(13.58)	(6.42)	(5.94)
Observations	12666	12367	11483	12666	12367	11483	12666	12367	11483
R-squared	0.012	0.271	0.664	0.011	0.265	0.675	0.019	0.072	0.602
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 6 Panel A reports the regression results of the effect of investor sentiment on ex-ante likelihood of covenant violations. This table provides estimates of the following model:

$$Violation_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is aggregate ex-ante likelihood of covenant violation, in columns (4) to (6) is ex-ante likelihood of performance covenant violation and in columns (7) to (9) is ex-ante likelihood of capital covenant violation. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

PVIOL: Aggregate probability of covenant violation (at the loan inception date) across all covenants included on a given loan package from the total set of fifteen covenant categories as outlined in Demerjian and Owens (2016)

PVIOL_PCOV – Aggregate probability of covenant violation (at the loan inception date) across all performance covenants included on a given loan package, where performance covenants include (1) Min. cash Interest coverage, (2) Min. debt service coverage, (3) Min. EBITDA, (4) Min. fixed charge coverage, (5) Min. interest coverage, (6) Max. debt-to-EBITDA, and (7) Max. senior debt-to-EBITDA

PVIOL_CCOV – Aggregate probability of covenant violation (at the loan inception date) across all capital covenants included on a given loan package, where capital covenants include (1) Min. quick ratio, (2) Min. current ratio, (3) Max. debt-to-equity, (4) Max. debt-to-tangible net worth, (5) Max. leverage, (6) Max. senior leverage, (7) Min. net worth, and (8) Min. tangible net worth

Panel B: The Effect of Firm Investor Sentiment on Likelihood of Covenant Violation

Variables	PVIOL			PVIOL_PCOV			PVIOL_CCOV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Firm Sentiment	-0.218***	-0.013	-0.071***	-0.237***	-0.037*	-0.093***	-0.003	0.027**	0.028**
	(0.025)	(0.022)	(0.025)	(0.025)	(0.022)	(0.024)	(0.012)	(0.012)	(0.012)
Ln (Spread)		0.077***	0.054***		0.083***	0.058***		-0.003	0.002
		(0.007)	(0.007)		(0.007)	(0.007)		(0.004)	(0.004)
Ln (Deal Amount)		-0.059**	-0.042***		-0.056***	-0.034***		-0.014***	-0.013***
		(0.003)	(0.005)		(0.003)	(0.004)		(0.002)	(0.002)
Ln (Maturity)		-0.031***	-0.003		-0.016***	0.000		-0.030***	-0.010***
		(0.006)	(0.006)		(0.006)	(0.006)		(0.003)	(0.003)
Collateral		0.072***	0.030***		0.059***	0.019*		0.027***	0.014**
		(0.009)	(0.011)		(0.009)	(0.011)		(0.005)	(0.006)
Performance Pricing		0.002	0.004		0.002	0.006		-0.002	0.000
		(0.007)	(0.007)		(0.007)	(0.007)		(0.004)	(0.003)
Sales		0.000***	-0.000***		0.000***	-0.000***		0.000***	-0.000**
		(0.38)	(-4.93)		(0.48)	(-3.54)		(0.91)	(-3.07)
Leverage		0.449***	0.353***		0.484***	0.383***		0.018*	0.009
		(0.018)	(0.029)		(0.018)	(0.028)		(0.010)	(0.015)
Tangibility		0.095***	0.004		-0.028*	-0.018		0.162***	0.111***
		(0.015)	(0.060)		(0.015)	(0.058)		(0.008)	(0.030)
ROA		-1.264***	-1.211***		-1.296***	-1.323***		-0.163***	0.000
		(0.046)	(0.070)		(0.045)	(0.068)		(0.024)	(0.035)
Cash Holding		-0.015	-0.321***		-0.009	-0.226***		0.041**	-0.119***
		(0.036)	(0.060)		(0.036)	(0.058)		(0.019)	(0.030)
Constant	0.473***	0.368***	0.445***	0.455***	0.280***	0.352***	0.056***	0.196***	0.109***
	(0.016)	(0.045)	(0.054)	(0.016)	(0.043)	(0.052)	(0.008)	(0.024)	(0.027)
Observations	10350	10109	10109	10350	10109	10109	10350	10109	10109
R-squared	0.007	0.267	0.672	0.009	0.276	0.68	0.003	0.073	0.637
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 6 Panel B reports the regression results of the effect of firm investor sentiment on ex-ante likelihood of covenant violations. This table provides estimates of the following model:

$$Violation_{it} = \beta_0 + \beta_1 Firm\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is aggregate ex-ante likelihood of covenant violation, in columns (4) to (6) is ex-ante likelihood of performance covenant violation and in columns (7) to (9) is ex-ante likelihood of capital covenant violation. The main variable of interest is Firm Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

PVIOL: Aggregate probability of covenant violation (at the loan inception date) across all covenants included on a given loan package from the total set of fifteen covenant categories as outlined in Demerjian and Owens (2016)

PVIOL_PCOV – Aggregate probability of covenant violation (at the loan inception date) across all performance covenants included on a given loan package, where performance covenants include (1) Min. cash Interest coverage, (2) Min. debt service coverage, (3) Min. EBITDA, (4) Min. fixed charge coverage, (5) Min. interest coverage, (6) Max. debt-to-EBITDA, and (7) Max. senior debt-to-EBITDA

PVIOL_CCOV – Aggregate probability of covenant violation (at the loan inception date) across all capital covenants included on a given loan package, where capital covenants include (1) Min. quick ratio, (2) Min. current ratio, (3) Max. debt-to-equity, (4) Max. debt-to-tangible net worth, (5) Max. leverage, (6) Max. senior leverage, (7) Min. net worth, and (8) Min. tangible net worth

TABLE 7: Poisson Regression - The Effect of Investor Sentiment on Debt Covenants

Variables	Performance Covenants			Capital Covenants			Covenant Intensity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High Sentiment	0.064***	0.107***	0.107***	0.849***	0.550***	0.550***	0.107***	0.194***	0.194***
	(4.40)	(7.42)	(5.91)	(24.40)	(16.90)	(15.47)	(6.00)	(14.01)	(7.09)
Ln (Spread)		0.157***	0.157***		-0.328***	-0.328***		0.294***	0.294***
		(11.19)	(10.33)		(-12.68)	(-9.22)		(18.87)	(20.63)
Ln (Deal Amount)		0.039***	0.039*		-0.287***	-0.287***		0.057***	0.057***
		(5.60)	(2.35)		(-21.22)	(-15.42)		(7.20)	(4.00)
Ln (Maturity)		0.143***	0.143***		-0.148***	-0.148***		0.063***	0.063***
		(12.55)	(11.62)		(-8.37)	(-7.13)		(5.74)	(4.82)
Collateral		0.098***	0.098***		-0.062	-0.062		0.936***	0.936***
		(5.75)	(4.60)		(-1.70)	(-1.83)		(32.01)	(18.81)
Performance Pricing		0.122***	0.122***		0.072*	0.072*		0.098***	0.098***
		(9.64)	(8.87)		(2.48)	(2.55)		(8.01)	(7.78)
Sales		-0.000***	-0.000***		0.000	0.000		-0.000***	-0.000***
		(-5.57)	(-6.74)		(1.10)	(1.41)		(-3.80)	(-3.93)
Leverage		0.213***	0.213***		-0.814***	-0.814***		0.167***	0.167***
		(6.18)	(6.31)		(-10.30)	(-7.54)		(5.78)	(5.62)
Tangibility		-0.212***	-0.212***		0.616***	0.616***		-0.144***	-0.144***
		(-5.96)	(-4.67)		(8.18)	(6.67)		(-4.68)	(-4.21)
ROA		0.711***	0.711***		-1.209***	-1.209***		0.351***	0.351***
		(8.64)	(6.45)		(-7.92)	(-4.38)		(5.06)	(6.65)
Cash Holding		-0.270***	-0.270***		-0.432**	-0.432***		-0.214**	-0.214**
		(-3.29)	(-4.07)		(-3.25)	(-3.79)		(-2.96)	(-2.92)
Constant	0.524***	-1.254***	-1.254***	-0.997***	3.085***	3.085***	0.993***	-1.983***	-1.983***
	(43.52)	(-13.60)	(-8.82)	(-29.14)	(18.98)	(11.91)	(63.06)	(-21.32)	(-20.36)
Observations	15782	14959	14959	15782	14959	14959	15782	14959	14959
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 7 reports the regression results of the effect of investor sentiment on debt covenants. This table provides estimates of the following model:

$$Financial\ Covenant\ Intensity_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using poisson regression using data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

TABLE 8: Poisson Regression - The Effect of Investor Sentiment on Likelihood of Covenant Violation

Variables	PVIOL			PVIOL_PCOV			PVIOL_CCOV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High Sentiment	0.233***	0.174***	0.174***	0.162***	0.126***	0.126***	0.772***	0.574***	0.574***
	(7.63)	(6.50)	(7.23)	(4.87)	(4.25)	(5.61)	(9.41)	(7.17)	(8.81)
Ln (Spread)		0.242***	0.242***		0.327***	0.327***		-0.088	-0.088
		(7.36)	(7.13)		(8.46)	(8.63)		(-1.31)	(-1.22)
Ln (Deal Amount)		-0.104***	-0.104***		-0.089***	-0.089***		-0.268***	-0.268***
		(-9.51)	(-7.07)		(-7.25)	(-6.02)		(-7.14)	(-6.19)
Ln (Maturity)		-0.033	-0.033*		-0.0065	-0.0065		-0.118*	-0.118**
		(-1.84)	(-2.02)		(-0.32)	(-0.36)		(-2.52)	(-2.65)
Collateral		0.288***	0.288***		0.285***	0.285***		0.429***	0.429***
		(6.76)	(6.18)		(5.80)	(5.57)		(4.19)	(4.07)
Performance Pricing		-0.0001	-0.0001		0.0148	0.0148		-0.0128	-0.0128
		(-0.00)	(-0.00)		(0.54)	(0.51)		(-0.20)	(-0.23)
Sales		-0.000	-0.000		0.000	0.000		0.000	0.000
		(-0.16)	(-0.21)		(0.11)	(0.15)		(0.59)	(0.59)
Leverage		0.822***	0.822***		0.922***	0.922***		0.577***	0.577*
		(14.32)	(19.80)		(14.47)	(17.77)		(3.66)	(2.22)
Tangibility		0.019	0.019		-0.179**	-0.179***		1.084***	1.084***
		(0.35)	(0.50)		(-2.80)	(-3.60)		(6.73)	(5.20)
ROA		-3.041***	-3.041***		-3.512***	-3.512***		-2.857***	-2.857***
		(-18.58)	(-14.31)		(-19.17)	(-14.92)		(-6.74)	(-7.36)
Cash Holding		-0.647***	-0.647***		-0.773***	-0.773***		0.028	0.028
		(-3.92)	(-5.28)		(-4.13)	(-5.45)		(0.07)	(0.07)
Constant	-1.010***	-1.729***	-1.729***	-1.095***	-2.397***	-2.397***	-2.792***	-1.024*	-1.024*
	(-37.50)	(-8.83)	(-9.94)	(-38.03)	(-10.35)	(-11.36)	(-37.91)	(-2.47)	(-2.26)
Observations	12666	12367	12367	12666	12367	12367	12666	12367	12367
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 8 reports the regression results of the effect of investor sentiment on ex-ante likelihood of covenant violations. This table provides estimates of the following model:

$$Violation_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using poisson regression using data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is aggregate ex-ante likelihood of covenant violation, in columns (4) to (6) is ex-ante likelihood of performance covenant violation and in columns (7) to (9) is ex-ante likelihood of capital covenant violation. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

PVIOL: Aggregate probability of covenant violation (at the loan inception date) across all covenants included on a given loan package from the total set of fifteen covenant categories as outlined in Demerjian and Owens (2016)

PVIOL_PCOV – Aggregate probability of covenant violation (at the loan inception date) across all performance covenants included on a given loan package, where performance covenants include (1) Min. cash Interest coverage, (2) Min. debt service coverage, (3) Min. EBITDA, (4) Min. fixed charge coverage, (5) Min. interest coverage, (6) Max. debt-to-EBITDA, and (7) Max. senior debt-to-EBITDA

PVIOL_CCOV – Aggregate probability of covenant violation (at the loan inception date) across all capital covenants included on a given loan package, where capital covenants include (1) Min. quick ratio, (2) Min. current ratio, (3) Max. debt-to-equity, (4) Max. debt-to-tangible net worth, (5) Max. leverage, (6) Max. senior leverage, (7) Min. net worth, and (8) Min. tangible net worth

TABLE 9: The Effect of Investor Sentiment (Michigan Consumer Confidence Index) on Debt Covenants

Variables	Performance Covenants			Capital Covenants			Covenant Intensity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
High Sentiment	0.344***	0.370***	0.265***	0.532***	0.385***	0.358***	0.686***	0.794***	0.490***
	(0.03)	(0.03)	(0.04)	(0.02)	(0.02)	(0.03)	(0.05)	(0.04)	(0.06)
Ln (Spread)		0.246***	0.148***		-0.161***	-0.096***		0.695***	0.476***
		(0.02)	(0.03)		(0.02)	(0.02)		(0.03)	(0.05)
Ln (Deal Amount)		0.071***	0.117***		-0.160***	-0.145***		0.154***	0.211***
		(0.01)	(0.02)		(0.01)	(0.01)		(0.02)	(0.03)
Ln (Maturity)		0.246***	0.089***		-0.130***	-0.050***		0.166***	-0.002
		(0.02)	(0.02)		(0.01)	(0.01)		(0.03)	(0.03)
Collateral		0.136***	0.009		-0.067**	-0.058		1.822***	1.586***
		(0.03)	(0.04)		(0.02)	(0.03)		(0.05)	(0.07)
Performance Pricing		0.178***	0.111***		-0.026	-0.008		0.222***	0.065
		(0.02)	(0.02)		(0.02)	(0.02)		(0.04)	(0.04)
Sales		-0.000***	-0.000**		0.000*	0		-0.000***	-0.000***
		0.00	0.00		0.00	0.00		0.00	0.00
Leverage		0.343***	-0.19		-0.342***	-0.136*		0.588***	0.128
		(0.07)	(0.10)		(0.04)	(0.07)		(0.09)	(0.18)
Tangibility		-0.332***	-0.286		0.361***	-0.107		-0.469***	0.101
		(0.06)	(0.25)		(0.05)	(0.15)		(0.09)	(0.43)
ROA		1.047***	0.414		-0.635***	0.475*		0.804***	-0.049
		(0.14)	(0.27)		(0.10)	(0.19)		(0.21)	(0.45)
Cash Holding		-0.275*	0.221		-0.121	-0.255		-0.383*	-0.013
		(0.12)	(0.23)		(0.08)	(0.15)		(0.19)	(0.40)
Constant	1.569***	-1.291***	-0.095	0.295***	2.730***	1.975***	2.481***	-4.135***	-2.132***
	(0.02)	(0.14)	(0.22)	(0.01)	(0.11)	(0.17)	(0.04)	(0.22)	(0.38)
Observations	15535	14612	14612	15535	14612	14612	15535	14612	14612
R-squared	0.031	0.180	0.741	0.116	0.287	0.798	0.033	0.467	0.789
Firm Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes

Table 9 looks at alternative measures of investor sentiment i.e., Michigan consumer confidence index. It reports the regression results of the effect of investor sentiment proxied by Michigan consumer confidence index on debt covenants. This table provides estimates of the following model:

$$\begin{aligned} &Financial\ Covenant\ Intensity_{it} \\ &\quad = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} \\ &\quad + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

TABLE 10: Financial Constraints - Investment Grade

Variables	Performance Covenants		Capital Covenants		Covenant Intensity	
	(1)	(2)	(1)	(2)	(1)	(2)
High Sentiment	0.397***	0.220**	0.265***	0.268***	0.822***	0.574***
	(0.07)	(0.08)	(0.04)	(0.04)	(0.09)	(0.12)
NINVG	0.135	-0.148	-0.053	-0.055	0.1	0.108
	(0.09)	(0.11)	(0.05)	(0.08)	(0.13)	(0.21)
*High Sentiment*NINVG*	0.286***	0.291**	0.121**	0.066	0.503***	0.354*
	(0.08)	(0.10)	(0.04)	(0.05)	(0.11)	(0.15)
Ln (Spread)	0.283***	0.165***	-0.159***	-0.080**	0.654***	0.460***
	(0.04)	(0.05)	(0.03)	(0.03)	(0.07)	(0.08)
Ln (Deal Amount)	0.038	0.049	-0.072***	-0.063***	0.022	0.158**
	(0.03)	(0.04)	(0.02)	(0.02)	(0.04)	(0.06)
Ln (Maturity)	0.213***	0.052	-0.086***	-0.029	-0.022	-0.081
	(0.03)	(0.03)	(0.02)	(0.01)	(0.05)	(0.04)
Collateral	0.07	0.098	-0.086*	-0.017	1.807***	1.536***
	(0.07)	(0.07)	(0.04)	(0.05)	(0.11)	(0.12)
Performance Pricing	0.193***	0.105*	0.018	0.034	0.248***	0.117
	(0.05)	(0.04)	(0.03)	(0.02)	(0.06)	(0.07)
Sales	-0.000**	0.000	0.000	0.000	0.000	-0.000**
	0.00	0.00	0.00	0.00	0.00	0.00
Leverage	0.464**	-0.454	-0.279***	-0.084	0.734***	0.156
	(0.14)	(0.25)	(0.07)	(0.11)	(0.19)	(0.36)
Tangibility	-0.433***	0.095	0.373***	-0.275	-0.328*	0.53
	(0.11)	(0.38)	(0.08)	(0.21)	(0.16)	(0.74)
ROA	0.889*	-0.749	-1.025***	0.53	0.869	0.135
	(0.34)	(0.67)	(0.21)	(0.45)	(0.49)	(1.08)
Cash Holding	-0.214	0.537	0.302	-0.224	0.015	-0.302
	(0.33)	(0.61)	(0.20)	(0.30)	(0.44)	(1.01)
Constant	-1.410***	0.38	2.052***	1.317***	-2.975***	-1.993**
	(0.31)	(0.44)	(0.21)	(0.21)	(0.44)	(0.69)
Observations	4199	3877	4199	3877	4199	3877
R-squared	0.251	0.803	0.243	0.821	0.554	0.843
Firm Fixed Effects	No	Yes	No	Yes	No	Yes

Table 10 reports the regression results of the effect of investor sentiment on debt covenants in the presence of financial constraints proxied by S&P long term debt ratings. This table provides estimates of the following model:

$$\begin{aligned} Financial\ Covenant\ Intensity_{it} \\ &= \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 NINVG_{it} + \beta_3 HighSentiment * NINVG_{it} + \beta_4 Ln\ (Spread)_{it} + \beta_5 Ln(Deal\ Amount)_{it} \\ &+ \beta_6 Ln(Maturity)_{it} + \beta_7 Collateral_{it} + \beta_8 Performance\ Pricing_{it} + \beta_9 Sales_{it-1} + \beta_{10} Leverage_{it-1} + \beta_{11} Tangibility_{it-1} \\ &+ \beta_{12} ROA_{it-1} + \beta_{13} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

NINVG: Non-investment group (financially constrained firms) having S&P long term debt ratings equal to or lower than BB+

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

TABLE 11: Financial Constraints - KZ Index

Variables	Performance Covenants		Capital Covenants		Covenant Intensity	
	(1)	(2)	(1)	(2)	(1)	(2)
HighSentiment	0.346***	0.235***	0.387***	0.358***	0.844***	0.581***
	(0.04)	(0.05)	(0.03)	(0.03)	(0.06)	(0.08)
KZ Index	-0.024	-0.001	-0.095***	-0.065	-0.074	0.058
	(0.04)	(0.06)	(0.03)	(0.04)	(0.07)	(0.09)
HighSentiment KZ Index*	0.119**	0.085	0.084**	0.041	0.267***	0.009
	(0.04)	(0.05)	(0.03)	(0.03)	(0.07)	(0.08)
Ln (Spread)	0.307***	0.221***	-0.166***	-0.108***	0.783***	0.591***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)	(0.06)
Ln (Deal Amount)	0.078***	0.150***	-0.161***	-0.151***	0.161***	0.236***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.04)
Ln (Maturity)	0.249***	0.078***	-0.132***	-0.031*	0.176***	0.023
	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Collateral	0.124***	0.004	-0.052	-0.044	1.797***	1.548***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.06)	(0.07)
Performance Pricing	0.203***	0.101***	-0.033	-0.017	0.260***	0.056
	(0.03)	(0.03)	(0.02)	(0.02)	(0.04)	(0.04)
Sales	-0.000***	-0.000*	0.000*	0.000	-0.000**	-0.000***
	0.00	0.00	0.00	0.00	0.00	0.00
Leverage	0.371***	-0.292*	-0.371***	-0.118	0.574***	0.015
	(0.08)	(0.13)	(0.05)	(0.09)	(0.12)	(0.19)
Tangibility	-0.321***	0.131	0.289***	-0.291	-0.375***	0.826
	(0.07)	(0.26)	(0.05)	(0.16)	(0.11)	(0.48)
ROA	1.254***	0.517	-0.755***	0.449	1.251***	0.08
	(0.17)	(0.32)	(0.12)	(0.24)	(0.25)	(0.53)
Cash Holding	-0.272	0.163	-0.101	-0.319	-0.234	0.029
	(0.15)	(0.27)	(0.10)	(0.19)	(0.23)	(0.47)
Constant	-1.736***	-0.719**	2.873***	2.096***	-4.905***	-3.236***
	(0.18)	(0.25)	(0.14)	(0.21)	(0.28)	(0.45)
Observations	10090	9051	10090	9051	10090	9051
R-squared	0.198	0.766	0.313	0.805	0.478	0.823
Firm Fixed Effects	No	Yes	No	Yes	No	Yes

Table 11 reports the regression results of the effect of investor sentiment on debt covenants in the presence of financial constraints proxied by KZ Index. This table provides estimates of the following model:

$$\begin{aligned} Financial\ Covenant\ Intensity_{it} \\ &= \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 KZ\ Index_{it} + \beta_3 HighSentiment * KZ\ Index_{it} + \beta_4 Ln\ (Spread)_{it} + \beta_5 Ln(Deal\ Amount)_{it} \\ &+ \beta_6 Ln(Maturity)_{it} + \beta_7 Collateral_{it} + \beta_8 Performance\ Pricing_{it} + \beta_9 Sales_{it-1} + \beta_{10} Leverage_{it-1} + \beta_{11} Tangibility_{it-1} \\ &+ \beta_{12} ROA_{it-1} + \beta_{13} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

KZ Index: Financially constrained firms whose KZ Index is above the sample median

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements.

TABLE 12: Financial Constraints - Firm Size

Variables	Performance Covenants		Capital Covenants		Covenant Intensity	
	(1)	(2)	(1)	(2)	(1)	(2)
High Sentiment	0.370***	0.260***	0.304***	0.290***	0.936***	0.559***
	(0.04)	(0.05)	(0.03)	(0.03)	(0.06)	(0.08)
SMALLFIRM	0.236***	0.098	-0.097***	0.035	0.635***	0.698***
	(0.05)	(0.08)	(0.03)	(0.05)	(0.08)	(0.11)
*High Sentiment*SMALLFIRM*	-0.017	-0.032	0.297***	0.199***	-0.173*	-0.268**
	(0.04)	(0.06)	(0.03)	(0.04)	(0.07)	(0.09)
Ln (Spread)	0.291***	0.217***	-0.171***	-0.105***	0.744***	0.586***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)	(0.05)
Ln (Deal Amount)	0.119***	0.154***	-0.149***	-0.134***	0.259***	0.278***
	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)	(0.04)
Ln (Maturity)	0.235***	0.078***	-0.138***	-0.034**	0.144***	0.014
	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Collateral	0.102**	0.004	-0.058*	-0.044	1.740***	1.532***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.06)	(0.07)
Performance Pricing	0.205***	0.101***	-0.032	-0.017	0.266***	0.059
	(0.03)	(0.03)	(0.02)	(0.02)	(0.04)	(0.04)
Sales	-0.000***	-0.000*	0.000*	0.000	-0.000*	-0.000***
	0.00	0.00	0.00	0.00	0.00	0.00
Leverage	0.416***	-0.258*	-0.412***	-0.152	0.667***	0.083
	(0.08)	(0.13)	(0.04)	(0.08)	(0.12)	(0.19)
Tangibility	-0.323***	0.098	0.321***	-0.319	-0.372***	0.65
	(0.07)	(0.26)	(0.05)	(0.16)	(0.10)	(0.47)
ROA	1.136***	0.461	-0.770***	0.363	0.974***	-0.219
	(0.17)	(0.33)	(0.12)	(0.23)	(0.24)	(0.52)
Cash Holding	-0.275	0.098	-0.039	-0.311	-0.238	-0.147
	(0.15)	(0.26)	(0.10)	(0.19)	(0.23)	(0.45)
Constant	-1.922***	-0.737**	2.836***	1.969***	-5.372***	-3.532***
	(0.18)	(0.26)	(0.14)	(0.21)	(0.29)	(0.45)
Observations	10090	9051	10090	9051	10090	9051
R-Squared	0.203	0.766	0.324	0.808	0.488	0.826
Firm Fixed Effects	No	Yes	No	Yes	No	Yes

Table 12 reports the regression results of the effect of investor sentiment on debt covenants in the presence of financial constraints proxied by Firm Size. This table provides estimates of the following model:

$$\begin{aligned} &Financial\ Covenant\ Intensity_{it} \\ &\quad = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Small\ Firm_{it} + \beta_3 HighSentiment * Small\ Firm_{it} + \beta_4 Ln\ (Spread)_{it} + \beta_5 Ln(Deal\ Amount)_{it} \\ &\quad + \beta_6 Ln(Maturity)_{it} + \beta_7 Collateral_{it} + \beta_8 Performance\ Pricing_{it} + \beta_9 Sales_{it-1} + \beta_{10} Leverage_{it-1} + \beta_{11} Tangibility_{it-1} \\ &\quad + \beta_{12} ROA_{it-1} + \beta_{13} Cash\ Holding_{it-1} + \varepsilon_{it} \end{aligned}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in columns (1) to (3) is performance covenants, in columns (4) to (6) is capital covenants and in columns (7) to (9) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements.

TABLE 13: Accounting Conservatism - C-Score

Variables	Performance Covenants		Capital Covenants		Covenant Intensity	
	(1)	(2)	(1)	(2)	(1)	(2)
High Sentiment	0.381***	0.256***	0.321***	0.318***	0.868***	0.537***
	(0.04)	(0.05)	(0.03)	(0.03)	(0.06)	(0.08)
NGC	-0.019	-0.036	-0.101***	-0.114***	-0.046	-0.174*
	(0.04)	(0.04)	(0.02)	(0.03)	(0.07)	(0.08)
*High Sentiment * NGC*	0.04	0.036	0.246***	0.154***	0.220**	0.177*
	(0.05)	(0.05)	(0.03)	(0.04)	(0.07)	(0.08)
Ln (Spread)	0.306***	0.219***	-0.152***	-0.102***	0.795***	0.597***
	(0.03)	(0.03)	(0.02)	(0.03)	(0.04)	(0.06)
Ln (Deal Amount)	0.075***	0.149***	-0.164***	-0.149***	0.154***	0.241***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.04)
Ln (Maturity)	0.251***	0.079***	-0.125***	-0.029*	0.183***	0.026
	(0.02)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Collateral	0.126***	0.006	-0.061*	-0.048	1.800***	1.547***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.06)	(0.07)
Performance Pricing	0.204***	0.099***	-0.030	-0.019	0.265***	0.052
	(0.03)	(0.03)	(0.02)	(0.02)	(0.04)	(0.04)
Sales	-0.000***	-0.000*	0.000*	0.000	-0.000**	-0.000***
	0.00	0.00	0.00	0.00	0.00	0.00
Leverage	0.403***	-0.268*	-0.396***	-0.155	0.653***	0.029
	(0.08)	(0.13)	(0.04)	(0.08)	(0.12)	(0.19)
Tangibility	-0.335***	0.123	0.298***	-0.28	-0.406***	0.82
	(0.07)	(0.26)	(0.05)	(0.17)	(0.10)	(0.48)
ROA	1.249***	0.505	-0.719***	0.453	1.248***	0.076
	(0.17)	(0.32)	(0.12)	(0.24)	(0.25)	(0.53)
Cash Holding	-0.293*	0.129	-0.058	-0.216	-0.273	0.038
	(0.14)	(0.26)	(0.10)	(0.18)	(0.22)	(0.46)
Constant	-1.730***	-0.687**	2.783***	2.058***	-4.988***	-3.204***
	(0.18)	(0.26)	(0.14)	(0.22)	(0.29)	(0.45)
Observations	10090	9051	10090	9051	10090	9051
R-squared	0.196	0.766	0.319	0.807	0.478	0.823
Firm Fixed Effects	No	Yes	No	Yes	No	Yes

Table 13 reports the regression results of the effect of investor sentiment on debt covenants conditional on the firm's accounting policies or a firms accounting conservatism measured as C-Score following Khan and Watts (2009). This table provides estimates of the following model:

$$\mathrm{C-Score_t} = \beta_4 = \alpha 1 + \alpha 2\mathrm{MVE_t} + \alpha 3\mathrm{MTB_t} + \alpha 4\mathrm{Leverage_t} + \varepsilon \quad (1)$$

$$\mathrm{NI_t} = \beta 1 + \beta 2\mathrm{D_t} + \mathrm{Returnt} * (\mu 1 + \mu 2\mathrm{MVE_t} + \mu 3\mathrm{MTB_t} + \mu 4\mathrm{Leverage_t}) + \mathrm{Dt} * \mathrm{Returnt} * (\alpha 1 + \alpha 2\mathrm{MVE_t} + \alpha 3\mathrm{MTB_t} + \alpha 4\mathrm{Leverage_t}) + (\delta 1\mathrm{MVE_t} + \delta 2\mathrm{MTB_t} + \delta 3\mathrm{Leverage_t} + \delta 4\mathrm{D} * \mathrm{MVE_t} + \delta 5\mathrm{D} * \mathrm{MTB_t} + \delta 6\mathrm{D} * \mathrm{Leverage_t}) + \varepsilon \quad (2)$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. I estimate equation (2) represented above using annual cross-sectional regressions. I estimate the coefficients from equation (2) and apply it to equation (1) to calculate the firm specific conservatism measure or C-Score. The dependent variable in columns (1) and (2) is performance covenants, in columns (3) and (4) is capital covenants and in columns (5) and (6) is covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

NGC: It is a dummy variable which takes a value of 1 for firms with C-Score values below the sample median and 0 for firms with C-score values above the sample median.

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements.

TABLE 14: Joint Determination of Spread and Covenants

Panel A: Joint Determination of Spread and Covenants in the presence of High Investor Sentiment

VARIABLES	(1)		(2)		(3)	
	Ln (Spread)	Performance Covenants	Ln (Spread)	Capital Covenants	Ln (Spread)	Covenant Intensity
High Sentiment	-0.269***	0.112***	-0.283***	0.375***	-0.252***	0.356***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Ln (Deal Amount)	-0.0547***	0.0484***	-0.0545***	-0.164***	-0.0550***	0.114***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Ln (Maturity)	0.0486***	0.248***	0.0496***	-0.115***	0.0474***	0.213***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Collateral	0.694***	0.339***	0.694***	-0.178***	0.695***	2.334***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.03)
Performance Pricing	-0.204***	0.147***	-0.204***	0.0449***	-0.204***	0.104***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Sales	-0.000***	-0.000***	-0.000***	0.000***	-0.000***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	0.428***	0.543***	0.428***	-0.495***	0.429***	0.954***
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.05)
ROA	-0.842***	1.069***	-0.843***	-0.441***	-0.841***	0.578***
	(0.05)	(0.08)	(0.05)	(0.07)	(0.05)	(0.14)
Cash Holding	0.199***	-0.355***	0.201***	-0.142**	0.196***	-0.409***
	(0.04)	(0.07)	(0.04)	(0.06)	(0.04)	(0.12)
GSD	0.0227***		0.0130*		0.0342***	
	(0.01)		(0.01)		(0.01)	
Tangibility		-0.378***		0.322***		-0.437***
		(0.03)		(0.02)		(0.05)
Constant	5.015***	0.073	5.028***	1.981***	5.000***	-0.597***
	(0.03)	(0.05)	(0.03)	(0.04)	(0.03)	(0.08)
Observations	14,952	14,952	14,952	14,952	14,952	14,952
R-squared	0.469	0.160	0.469	0.261	0.469	0.43

Table 14 Panel A reports the results of the simultaneous regressions of loan spread and loan covenants in the presence of high investor sentiment. This table provided estimates of the following model:

$$Ln\ (Spread)_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln(Deal\ Amount)_{it} + \beta_3 Ln(Maturity)_{it} + \beta_4 Collateral_{it} + \beta_5 Performance\ Pricing_{it} + \beta_6 Sales_{it-1} + \beta_7 Leverage_{it-1} + \beta_8 GSD_{it} + \beta_9 ROA_{it-1} + \beta_{10} Cash\ Holding_{it-1} + \varepsilon_{it}$$

$$Financial\ Covenant\ Intensity_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln(Deal\ Amount)_{it} + \beta_3 Ln(Maturity)_{it} + \beta_4 Collateral_{it} + \beta_5 Performance\ Pricing_{it} + \beta_6 Sales_{it-1} + \beta_7 Leverage_{it-1} + \beta_8 Tangibility_{it-1} + \beta_9 ROA_{it-1} + \beta_{10} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variables for joint determination in column (1) are ln (spread) and performance covenants, in column (2) are ln (spread) and capital covenants and in column (3) are ln (spread) and covenant intensity. The main variable of interest is High Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

Panel B: Joint Determination of Spread and Covenants in the presence of High Firm Sentiment

VARIABLES	(1)		(2)		(3)	
	Ln (Spread)	Performance Covenants	Ln (Spread)	Capital Covenants	Ln (Spread)	Covenant Intensity
Firm Sentiment	-0.170***	0.085**	-0.167***	0.169***	-0.168***	0.065
	(0.031)	(0.035)	(0.030)	(0.024)	(0.030)	(0.059)
Ln (Deal Amount)	-0.0435***	-0.0144**	-0.0433***	-0.102***	-0.0440***	0.00639
	(0.004)	(0.006)	(0.004)	(0.004)	(0.004)	(0.011)
Ln (Maturity)	0.0590***	0.169***	0.0593***	-0.145***	0.0578***	0.00449
	(0.009)	(0.014)	(0.009)	(0.010)	(0.009)	(0.023)
Collateral	0.633***	0.211***	0.633***	-0.150***	0.633***	2.299***
	(0.011)	(0.018)	(0.011)	(0.012)	(0.011)	(0.030)
Performance Pricing	-0.208***	0.0844***	-0.208***	0.0103	-0.209***	0.0349
	(0.010)	(0.016)	(0.010)	(0.011)	(0.010)	(0.027)
Sales	-0.000***	-0.000***	-0.000***	0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	0.436***	0.401***	0.436***	-0.295***	0.434***	0.878***
	(0.025)	(0.040)	(0.025)	(0.027)	(0.025)	(0.067)
ROA	-1.081***	0.938***	-1.083***	-0.390***	-1.077***	0.0125
	(0.060)	(0.097)	(0.060)	(0.067)	(0.060)	(0.163)
Cash Holding	0.312***	-0.417***	0.314***	-0.252***	0.305***	-0.626***
	(0.045)	(0.074)	(0.045)	(0.051)	(0.045)	(0.125)
GSD	0.0747***		0.0730***		0.0821***	
	(0.005)		(0.005)		(0.005)	
Tangibility		-0.349***		0.420***		-0.458***
		(0.034)		(0.023)		(0.056)
Constant	4.904***	0.868***	4.902***	1.602***	4.900***	0.971***
	(0.040)	(0.057)	(0.040)	(0.040)	(0.040)	(0.097)
Observations	11,631	11,631	11,631	11,631	11,631	11,631
R-squared	0.417	0.102	0.417	0.143	0.417	0.427

Table 14 Panel B reports the results of the simultaneous regressions of loan spread and loan covenants in the presence of high firm sentiment. This table provided estimates of the following model:

$$Ln\ (Spread)_{it} = \beta_0 + \beta_1 Firm\ Sentiment_{it} + \beta_2 Ln(Deal\ Amount)_{it} + \beta_3 Ln(Maturity)_{it} + \beta_4 Collateral_{it} + \beta_5 Performance\ Pricing_{it} + \beta_6 Sales_{it-1} + \beta_7 Leverage_{it-1} + \beta_8 GSD_{it} + \beta_9 ROA_{it-1} + \beta_{10} Cash\ Holding_{it-1} + \varepsilon_{it}$$

$$Financial\ Covenant\ Intensity_{it} = \beta_0 + \beta_1 Firm\ Sentiment_{it} + \beta_2 Ln(Deal\ Amount)_{it} + \beta_3 Ln(Maturity)_{it} + \beta_4 Collateral_{it} + \beta_5 Performance\ Pricing_{it} + \beta_6 Sales_{it-1} + \beta_7 Leverage_{it-1} + \beta_8 Tangibility_{it-1} + \beta_9 ROA_{it-1} + \beta_{10} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variables for joint determination in column (1) are ln (spread) and performance covenants, in column (2) are ln (spread) and capital covenants and in column (3) are ln (spread) and covenant intensity. The main variable of interest is Firm Sentiment.

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

TABLE 15: Impact of High Sentiment on Covenants based on Loan Maturity

Panel A: Performance Covenants

Variables	(1)		(2)		(3)	
	<1 Year	>1 Year	<3 Year	>3 Year	<5 Year	>5 Year
High Sentiment	-0.041	0.197***	0.048*	0.229***	0.099***	0.259***
	(0.072)	(0.016)	(0.028)	(0.019)	(0.020)	(0.027)
Ln (Spread)	0.069	0.264***	0.234***	0.280***	0.207***	0.310***
	(0.059)	(0.015)	(0.024)	(0.018)	(0.018)	(0.025)
Ln (Deal Amount)	0.069***	0.059***	0.101***	0.027***	0.086***	-0.004
	(0.025)	(0.006)	(0.010)	(0.007)	(0.007)	(0.010)
Ln (Maturity)	-0.233**	0.255***	0.242***	0.497***	0.222***	0.821***
	(0.108)	(0.015)	(0.026)	(0.036)	(0.016)	(0.092)
Collateral	0.056	0.163***	0.092**	0.176***	0.148***	0.162***
	(0.087)	(0.021)	(0.036)	(0.025)	(0.026)	(0.034)
Performance Pricing	0.100	0.203***	0.186***	0.196***	0.147***	0.279***
	(0.091)	(0.016)	(0.029)	(0.018)	(0.020)	(0.025)
Sales	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.284*	0.456***	0.268***	0.446***	0.338***	0.465***
	(0.151)	(0.033)	(0.061)	(0.037)	(0.042)	(0.048)
Tangibility	0.061	-0.391***	-0.223***	-0.438***	-0.323***	-0.501***
	(0.156)	(0.032)	(0.058)	(0.037)	(0.040)	(0.050)
ROA	1.629***	1.258***	1.822***	0.963***	1.809***	0.246*
	(0.383)	(0.087)	(0.141)	(0.105)	(0.104)	(0.143)
Cash Holding	-1.152***	-0.381***	-0.787***	-0.191**	-0.591***	-0.0605
	(0.314)	(0.074)	(0.125)	(0.087)	(0.092)	(0.114)
Constant	1.062**	-1.334***	-1.193***	-2.187***	-0.998***	-3.495***
	(0.421)	(0.096)	(0.152)	(0.166)	(0.112)	(0.376)
Observations	637	14,315	4,232	10,720	8,790	6,162
R-Squared	0.084	0.177	0.155	0.166	0.151	0.215

Table 15 Panel A reports the regression results of the effect of investor sentiment on debt covenants based on loan maturity. This table provides estimates of the following model:

$$Performance\ Covenants_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in all columns (1) to (3) is performance covenants. The main variable of interest is High Sentiment. The subsample for loan maturities of one year is shown in column (1), of three years is shown in column (2) and of five years is shown in column (3).

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

Panel B: Capital Covenants

Variables	(1)		(2)		(3)	
	<1 Year	>1 Year	<3 Year	>3 Year	<5 Year	>5 Year
High Sentiment	0.372***	0.310***	0.296***	0.330***	0.323***	0.294***
	(0.068)	(0.012)	(0.026)	(0.014)	(0.017)	(0.018)
Ln (Spread)	-0.123**	-0.201***	-0.159***	-0.225***	-0.199***	-0.221***
	(0.056)	(0.012)	(0.022)	(0.013)	(0.016)	(0.016)
Ln (Deal Amount)	-0.196***	-0.172***	-0.210***	-0.136***	-0.189***	-0.130***
	(0.024)	(0.005)	(0.009)	(0.005)	(0.006)	(0.007)
Ln (Maturity)	0.219**	-0.132***	0.021	-0.293***	-0.046***	0.001
	(0.103)	(0.012)	(0.025)	(0.026)	(0.014)	(0.060)
Collateral	0.205**	-0.049***	0.028	-0.063***	-0.044**	-0.028
	(0.083)	(0.016)	(0.033)	(0.018)	(0.022)	(0.022)
Performance Pricing	-0.025	0.004	0.037	0.014	0.035**	-0.014
	(0.087)	(0.012)	(0.027)	(0.013)	(0.017)	(0.016)
Sales	0.000	0.000**	0.000***	0.000	0.000*	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.964***	-0.381***	-0.710***	-0.277***	-0.502***	-0.277***
	(0.143)	(0.025)	(0.057)	(0.027)	(0.036)	(0.031)
Tangibility	0.196	0.324***	0.278***	0.338***	0.276***	0.417***
	(0.148)	(0.025)	(0.054)	(0.026)	(0.034)	(0.033)
ROA	-0.448	-0.616***	-0.422***	-0.695***	-0.525***	-0.724***
	(0.364)	(0.067)	(0.131)	(0.074)	(0.089)	(0.093)
Cash Holding	0.223	-0.127**	-0.041	-0.160***	-0.083	-0.130*
	(0.299)	(0.057)	(0.116)	(0.062)	(0.079)	(0.074)
Constant	1.946***	3.085***	2.637***	3.623***	2.905***	2.311***
	(0.401)	(0.074)	(0.141)	(0.118)	(0.096)	(0.245)
Observations	637	14,315	4,232	10,720	8,790	6,162
R-Squared	0.300	0.275	0.243	0.267	0.247	0.254

Table 15 Panel B reports the regression results of the effect of investor sentiment on debt covenants based on loan maturity. This table provides estimates of the following model:

$$Capital\ Covenants_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in all columns (1) to (3) is capital covenants. The main variable of interest is High Sentiment. The subsample for loan maturities of one year is shown in column (1), of three years is shown in column (2) and of five years is shown in column (3).

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

Performance Covenants: The number of performance covenants. According to Christensen and Nikolaev (2012), performance covenants are based on (i) cash interest coverage ratio, (ii) debt service coverage ratio, (iii) level of EBITDA, (iv) fixed charge coverage ratio, (v) interest coverage ratio, (vi) ratio of debt to EBITDA, and (vii) ratio of senior debt to EBITDA

Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements

Panel C: Covenant Intensity

Variables	(1)		(2)		(3)	
	<1 Year	>1 Year	<3 Year	>3 Year	<5 Year	>5 Year
High Sentiment	0.109	0.579***	0.199***	0.659***	0.342***	0.768***
	(0.110)	(0.025)	(0.041)	(0.030)	(0.031)	(0.042)
Ln (Spread)	0.685***	0.683***	0.701***	0.703***	0.647***	0.694***
	(0.091)	(0.024)	(0.036)	(0.029)	(0.029)	(0.039)
Ln (Deal Amount)	0.300***	0.140***	0.254***	0.069***	0.189***	0.051***
	(0.039)	(0.009)	(0.015)	(0.012)	(0.011)	(0.016)
Ln (Maturity)	-0.163	0.215***	0.157***	0.679***	0.174***	1.131***
	(0.166)	(0.023)	(0.040)	(0.056)	(0.025)	(0.142)
Collateral	1.655***	1.866***	1.612***	1.941***	1.724***	2.044***
	(0.133)	(0.033)	(0.053)	(0.039)	(0.040)	(0.053)
Performance Pricing	0.253*	0.239***	0.153***	0.237***	0.119***	0.399***
	(0.140)	(0.024)	(0.044)	(0.028)	(0.031)	(0.038)
Sales	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	0.440*	0.661***	0.444***	0.625***	0.600***	0.547***
	(0.232)	(0.051)	(0.092)	(0.059)	(0.066)	(0.075)
Tangibility	-0.069	-0.449***	-0.316***	-0.482***	-0.409***	-0.567***
	(0.239)	(0.050)	(0.087)	(0.058)	(0.062)	(0.078)
ROA	1.940***	1.113***	1.288***	1.002***	1.487***	0.469**
	(0.588)	(0.136)	(0.212)	(0.164)	(0.162)	(0.221)
Cash Holding	-0.086	-0.571***	-0.363*	-0.543***	-0.453***	-0.571***
	(0.483)	(0.116)	(0.187)	(0.137)	(0.143)	(0.177)
Constant	-3.773***	-4.125***	-4.174***	-5.748***	-3.822***	-7.631***
	(0.647)	(0.150)	(0.228)	(0.261)	(0.175)	(0.583)
Observations	637	14,315	4,232	10,720	8,790	6,162
R-Squared	0.432	0.464	0.448	0.475	0.421	0.534

Table 15 Panel C reports the regression results of the effect of investor sentiment on debt covenants based on loan maturity. This table provides estimates of the following model:

$$Covenant\ Intensity_{it} = \beta_0 + \beta_1 High\ Sentiment_{it} + \beta_2 Ln\ (Spread)_{it} + \beta_3 Ln(Deal\ Amount)_{it} + \beta_4 Ln(Maturity)_{it} + \beta_5 Collateral_{it} + \beta_6 Performance\ Pricing_{it} + \beta_7 Sales_{it-1} + \beta_8 Leverage_{it-1} + \beta_9 Tangibility_{it-1} + \beta_{10} ROA_{it-1} + \beta_{11} Cash\ Holding_{it-1} + \varepsilon_{it}$$

The model is estimated using OLS and pooled data of loan facilities issued over the periods of 1996 to 2017. The dependent variable in all columns (1) to (3) is covenant intensity. The main variable of interest is High Sentiment. The subsample for loan maturities of one year is shown in column (1), of three years is shown in column (2) and of five years is shown in column (3).

The t-statistics are reported in the parentheses and are based on heteroscedasticity consistent standard errors clustered by lender.

*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively.

Variable Definitions:

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Capital Covenants: The number of capital covenants. According to Christensen and Nikolaev (2012), capital covenants are based on (i) quick ratio, (ii) current ratio, (iii) debt-to-equity ratio, (iv) loan-to-value ratio, (v) ratio of debt to tangible net worth, (vi) leverage ratio, (vii) senior leverage ratio, and (viii) net worth requirement

Covenant Intensity: An index developed by Bradley and Roberts (2015). It captures covenant strictness with higher (lower) index value indicates stricter (looser) covenant requirements