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Document Version

Accepted author manuscript

Published in:

Journal of Corporate Finance

DOI:

[10.1016/j.jcorpfin.2017.05.009](https://doi.org/10.1016/j.jcorpfin.2017.05.009)

Publication date:

2017

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Citation for published version (APA):

Freudenberg, F., Imbierowicz, B., Saunders, A., & Steffen, S. (2017). Covenant Violations and Dynamic Loan Contracting. *Journal of Corporate Finance*, 45, 540–565. <https://doi.org/10.1016/j.jcorpfin.2017.05.009>

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Journal article (Accepted manuscript*)

Please cite this article as:

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* This version of the article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the publisher's final version AKA Version of Record.

Uploaded to [CBS Research Portal](#): February 2019

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Covenant Violations and Dynamic Loan Contracting

Felix Freudenber[†] Björn Imbierowicz[‡] Anthony Saunders^{*} Sascha Steffen[§]

Abstract

This paper examines the dynamic allocation of control rights in private debt contracts of firms. We show that a covenant violation in the prior loan contract implies a stigma for borrowers which results in stricter loan contract terms in subsequent new loan contracts. Our analyses reject potentially other explanations such as firm characteristics or agency problems between the lender and firm management, shareholders or public debtholders. After covenant violations in the prior contract, new loans have on average 18bps higher spreads and include more of those covenant types which also have been violated in the prior contract, with tighter thresholds.

JEL Classification: G21, G32, L14.

Keywords: Control Rights, Covenant Violation, Dynamic Loan Contracting, Stigma.

We thank Heitor Almeida, Thorsten Beck, Tobias Berg, Allen Berger, Lamont Black, Sapnoti Eswar, Jens Hagendorff, Paul Heidhues, Martin Hibbeln, Mark Humphery-Jenner, Vasso Ioannidou, Jan Krahnen, Simon Kwan, Bart Lambrecht, Christian Leuz, Ulrike Malmendier, Justin Murfin, Greg Nini, Michael Roberts, Jörg Rocholl, Raluca Roman, Catalina Stefanescu-Cuntze, Gregory Udell, Mark Wahrenburg, Andrew Winton, Robert DeYoung and participants at the Bank Structure Conference in Chicago, the American Finance Association Meetings in San Diego, the Financial Intermediation Research Society Conference in Dubrovnik, the European Finance Association Meetings in Copenhagen, the NYU Corporate Governance Seminar in New York, the Financial Management Association European Conference in Luxembourg, the Campus for Finance in Vallendar, the Brown Bag Seminar in Frankfurt, the Financial Management Association Meetings in Chicago, and the Workshop on Banking and Finance in Münster. Björn Imbierowicz gratefully acknowledges financial support from the Fritz Thyssen Foundation, and the Center for Financial Frictions (FRIC), grant no. DNR102.

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Abstract

This paper examines the dynamic allocation of control rights in private debt contracts of firms. We show that a covenant violation in the prior loan contract implies a stigma for borrowers which results in stricter loan contract terms in subsequent new loan contracts. Our analyses reject potentially other explanations such as firm characteristics or agency problems between the lender and firm management, shareholders or public debtholders. After covenant violations in the prior contract, new loans have on average 18bps higher spreads and include more of those covenant types which also have been violated in the prior contract, with tighter thresholds.

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1. Introduction

The literature on incomplete contracts argues that for firm value maximization control should be balanced between the entrepreneur and the investor and cash flow rights and control rights should be correlated (Aghion and Bolton, 1992; Dewatripont and Tirole, 1994). Accordingly, control should be allocated to investors with a concave cash flow claim (such as debt) in low profitability states and in high profitability states to investors with a convex cash flow claim (such as equity). Specifically, loans with financial covenants allow for shifts in control to lenders in bad states. This improves ex ante managerial incentives and maximizes firm value (Zender, 1991; Aghion et al., 1994; Dewatripont and Tirole, 1994; Berglöf and von Thadden, 1994).¹ Moreover, an increased scope for renegotiation increases contracting efficiency and minimizes opportunistic behavior (Christensen et al., 2015). In our study, we investigate empirically if a covenant violation is a signal from the prior loan contract which induces lenders to act as “tough principals” in the subsequent new loan by increasing the scope for renegotiation (e.g.; Huberman and Kahn, 1988; Aghion et al., 1994; Dewatripont and Tirole, 1994; Li, Vasvari and Wittenberg-Moerman 2015). Importantly, we argue that a covenant violation affects loan contract terms *in addition to* borrower characteristics at the origination of the new loan and is also not related to hold-up of borrowers by particular lenders. A covenant violation implies a stigma for borrowers.

A covenant violation is in most cases related to borrower credit risk at the time of violation. However, their impact on new loans, which are initiated at a very different point in time, is much less clear. Recent findings in the literature show that borrower characteristics substantially *improve* after a covenant violation. In the period after a violation borrowers reduce acquisitions and investments, do not assume further leverage and decrease shareholder payouts, risk shifting is limited and corporate governance improved (Chava and Roberts, 2008; Roberts and Sufi, 2009a, b; Nini et al., 2009, 2012). Thus, while firm risk is clearly elevated at the time of the covenant violation it decreases back towards “regular” levels over the year following the violation.²

¹ The existence of covenants increases the availability of credit (Stiglitz and Weiss, 1983; Diamond, 1984; Besanko and Kanatas, 1993). Covenants act as a tripwire mechanism, which immediately shifts control rights from borrowers back to lenders once they are violated (Jensen and Meckling, 1976; Smith and Warner, 1979; Aghion and Bolton, 1992; Berlin and Mester, 1992).

² Note that the time period between a covenant violation and the initiation of a subsequent new contract is substantial. Our data show that new loans subsequent to a covenant violation are originated, on average, 1,091 days after a violation.

The contract terms of a new loan are also unlikely to reflect the outcome of the last renegotiation round of the previous loan. Denis and Wang (2014) and Roberts (2015) show that the majority of renegotiations does not relate to covenant violation and implies a *relaxation* of previous restrictions.³ Denis and Wang (2014) observe that a tightening of thresholds in renegotiations effectively implies that they are brought back to their original level. Regarding covenant violations, they find that lenders rarely change the covenant limits in case of violations. The authors argue that a violation (instead of a prior renegotiation to avoid this violation) reflects lenders' thorough evaluation of the borrower's characteristics and prospects at this time. In simple words, lenders allow for violations only because borrowers shirk and/or have substantially misevaluated projects and their future performance. Accordingly, a covenant violation is a publicly observable negative signal. This relates to the results on borrower misbehavior and higher default rates in the retail loan market (e.g.; Agarwal et al., 2015; Garmaise, 2015). In our study, we investigate the consequences of misbehavior in a dynamic setup. We hypothesize that the prior covenant violation signal induces lenders to act as tough principals in the subsequent loan such that they implement a "tougher financial structure" in the new loan contract.⁴ More specifically, we expect the loan spread as well as the number and strictness of covenants to increase in a new loan following a covenant violation in the prior loan. We argue that the signal of a covenant violation results in a stigma for the borrower.

Financial covenants are part of virtually all private credit agreements (Leftwich, 1983; Roberts and Sufi, 2009a). As documented in earlier literature, existing data sources such as LPC Dealscan have limitations in keeping a full record of covenants as well as the complexity of covenant structures in loan contracts. We therefore follow Demerjian and Owens (2016) and build our analysis on a novel and hand-generated dynamic data set of individual borrower loans and covenants constructed from original loan contracts identified in borrowers' SEC filings. Our sample comprises 3,813 loans made over the 1996 to 2010 period.⁵ We collect more than 80 different covenant types and definitions from these loan contracts. We also know step-up and step-down provisions for each covenant. We use all the information available to us from these contracts to calculate covenant violations on a quarterly basis. Based on this, we build an indicator variable for covenant violation and match it to the subsequent new loan of the same borrower.

³ Furthermore, Gärdenau and Zwiebel (2009) argue in a theoretical paper that in renegotiations of existing loans covenants typically weaken rather than tighten.

⁴ As an example, Dewatripont and Tirole (1994) suggest to for example use more short-term debt. Long-term debt with more and tighter covenants relates to this notion.

⁵ After applying a large number of filters and after matching these loan contracts to the LPC Dealscan and the merged CRSP/Compustat database.

To measure contract strictness we use covenant information from the 80 covenant types we identify in our data and for each type in each quarter subtract the covenant threshold from the actual value of the financial covenant and normalize its absolute value with the standard deviation of the covenant variable, derived over the previous 12 quarters. Analogous to the “Distance to Default” (“DD”) measure that is used to measure a firm’s probability of default, this measure that might be viewed as a “Distance to Covenant Violation” or “DCV” measure. Comparable with Prilmeier (2016), the covenant with the lowest DCV of all covenants in a contract is a measure of the contract’s distance to covenant violation. In addition, we use the “average distance to covenant violation”, which is an index using a simple averaging mechanism over the individual DCVs of all covenants in a contract. The distance to covenant violation represents the distance an accounting-based covenant value/ ratio must deteriorate (in terms of its number of standard deviations) before a covenant threshold is violated. A lower value suggests that covenants are (on average) stricter. Following Bradley and Roberts (2004), we also utilize a Contract Intensity Index that reflects the overall restrictiveness of the loan on the actions of the borrower’s management.

We analyze the dynamic allocation of control rights over consecutive private debt contracts of the same borrower, focusing on firms that are recurring borrowers in the syndicated loan market. We know which firms violate covenants and which covenants are violated at any moment in time. We also know how lenders react in any subsequent loan contract, how they set covenant levels and how these differ from prior loan contracts to the same borrower. We find that after covenant violations in the prior loan contract lenders demand higher spreads and also increase the number and tightness of covenants in the following (new) loan contract, consistent with lenders acting as tough principals. This result is robust to unobservable constant borrower characteristics and confirmed in matching models and a regression discontinuity design. We provide several additional tests which show that the tougher financial structure in the new loan is not driven by other factors such as (i) firm credit risk, (ii) disciplining of managers, (iii) hold-up issues or (iv) differences in corporate governance characteristics. This argues for a prior covenant violation being a stigma for borrowers.

We investigate these alternative explanations in detail. Specifically, we investigate the effect of prior covenant violation on the loan contract terms of the new loan between matched firms which only differ in having violated a covenant in the prior loan using propensity score matching as well as a regression discontinuity design. In both setups we find our results confirmed. In addition, we investigate

borrower credit risk in more detail. We document a continuous decrease of borrower risk (as measured by the probability of default (PD)) after covenant violations. The PD converges to the PD of similar, non-violating borrowers about 800 days after the violation. However, we find that subsequent *new* loans are originated, on average, 1,091 days after a violation. This suggests that borrowers who did or did not violate covenants in a previous loan exhibit similar default risk based on ex-ante observable characteristics at the time of a subsequent loan origination. Furthermore, we also test if covenant violations predict differences in borrower credit risk over a long-term period incorporating borrower defaults, rating downgrades, changes in net worth and leverage as well as the number of loss-making quarters. These tests confirm that the initially higher risk of violating borrowers dissolves over time.

We also analyze potential managerial agency problems by investigating the contract terms of a subsequent new loan for firms with and without a change in its CEO, also accounting for the reason of the CEO change, i.e. if, for example, the CEO was forced to resign. Furthermore, we examine if borrowers are “held up” by banks (Sharpe, 1990; Rajan, 1992) differentiating firms by their access to public debt capital markets, an alternative to bank financing. We also test differences in corporate governance using the ownership structure of borrowing firms. None of these alternatives explains the tougher covenant structure in subsequent new loans after covenant violations in the prior contract. In contrast, our results suggest that prior covenant violations are a stigma for the borrower.

In a further set of tests, we explore if the tougher financial structure in the new contract is related to the severity of covenant violation in the prior contract. We hypothesize that lenders tighten contract terms more the worse the covenant violation(s) in the prior loan, that is, there are differences in stigmatization. More specifically, we analyze the impact of the number of violated covenants in the prior loan on the contract terms of the subsequent new loan. We find that lenders are tougher the higher the violation severity of covenants in the prior loan. Covenants become stricter and the loan spread increases more in the new contract when there are a higher number of covenants violated in a prior loan contract.

We are also interested if violations of specific types of financial covenants have a different impact on the contract terms of the subsequent new loan. For this purpose, we classify covenants into profitability-based and capital-based covenants following Christensen and Nikolaev (2012) and further

refine their covenant classification by distinguishing capital-based covenants into leverage, net worth and short-term covenants. Our results show that irrespective of the type of violated covenants, lenders implement a tougher financial structure in the subsequent new contract and use more and tighter covenants (of the same type as violated before) and charging higher loan spreads.

We then explore the dynamic development of loan contract terms over multiple consecutive new loan contracts to the same borrower as a function of whether or not the borrower violated covenants in the prior loan. Borrowers become less opaque the more frequently they borrow in the syndicated loan market. Interestingly, we document that repeated borrowing (without a covenant violation) has, on average, almost no effect on loan spreads but a sizable effect on non-price terms reflected in fewer and less restrictive covenants. However, importantly, if borrowers violate covenants in a prior loan, lenders increase loan spreads as well as increase the number and tightness of financial covenants in a subsequent new loan, irrespective of the frequency of borrowing new loans. In sum, these findings argue for changes in stigma over time. More violations over more contracts result in a stronger stigma. However, this can also be “cured” by the borrower by good conduct, i.e. not violating covenants in loan contracts.

Finally, we investigate if the changes in the financial structure after covenant violations help to address potential agency and information problems in the subsequent new contract. We therefore analyze the effect of covenant violations on the size and composition of the lending syndicate in the subsequent new loan. Overall, we neither find significant differences in the number of lenders that participate in syndicates of loans to borrowers who did and did not violate a covenant in their prior loan nor on the size of loans provided by each syndicate lender. Moreover, we find that borrowers who violated covenants are neither more nor less likely to switch to new lenders. Thus, it appears that covenant structures and the possibility for lenders to act as tough principals after borrower misconduct help to address information asymmetry and supply side frictions in primary loan markets. Furthermore, it confirms that the tougher financial structure is not related to particular lenders extracting “unfair” rents from the borrower after a covenant violation in the prior contract.

Our paper proceeds as follows. The next section describes how we construct our data set and provides descriptive statistics. Section 3 empirically explores dynamic loan contract design after covenant violations and examines alternative explanations for our findings. Section 4 investigates the severity of covenant violations and the type of covenant violated together with the type of covenant included after

violations. Section 5 provides an analysis of dynamic loan contracting over multiple consecutive loan contracts of the same borrower followed by results for the supply side of capital. Section 7 concludes.

2. Data and Descriptive Statistics

2.1 Data

To investigate the effect of covenant violations on subsequent loan contracting, we construct a unique data set collecting original loan contracts directly from the Security and Exchange Commission (SEC) filings of public firms using EDGAR (Electronic Data-Gathering, Analysis and Retrieval). Material loan contracts have to be reported as required by the SEC and can be found as an exhibit to a 10-K, 10-Q or as an attachment to an 8-K filing. By collecting covenant definitions directly from loan contracts we follow the suggestion in Demerjian and Owens (2016) because covenants are frequently customized and might otherwise contain measurement errors (e.g.; Leftwich, 1983; El Gazzar and Pastena, 1990; Beatty et al., 2008). We start with the set of private credit agreements provided by Greg Nini, David Smith and Amir Sufi who collected these contracts over the 1996 to 2005 period and extend this set of contracts for 5 more years until the end of 2010 following their methodology. We add 1,276 loan contracts from EDGAR to the 3,720 contracts from Nini, Smith and Sufi (2009) and apply various filters to these 4,996 credit agreements. We exclude all observations where we cannot identify a contract in Dealscan as well as loans specified as amendments in Dealscan or in the loan contract (Roberts, 2015). In other words, all contracts are *new* loans.

Private loan agreements typically include positive, negative, and financial covenants.⁶ Negative covenants prevent the borrower from certain actions such as excessive investments, distribution of dividends, sale of assets, changes in company control, entering sale-and-lease-back transactions, or changing business activities. Financial covenants are often termed “performance hurdles” or “tripwires” (e.g.; Smith, 1993; Dichev and Skinner, 2002) due to their ability to shift control rights. Although Dealscan already provides some information on financial covenants, we still find that several covenants

⁶ We do not include positive covenants such as punctual payment of interest and principal, delivery of financial statements, property and equipment maintenance, compliance to accounting standards, or paying insurance and taxes, as these are often not directly observable, in line with, for example, Bradley and Roberts (2004) and Demiroglu and James (2010). In addition, there exist incurrence covenants which refer to a predetermined event, such as the issuance of new debt or the acquisition of another company.

are missing. Furthermore, the definition of seemingly similar covenants differs substantially between contracts and is aggregated in Dealscan without further information. Additionally, only one threshold for financial covenants is recorded in the database, but thresholds frequently change over the contract period via step-down or step-up provisions.⁷ Li et al. (2015) show that the latter are included in almost half of all syndicated loan contracts. These cannot be found in Dealscan. We therefore manually collect a novel set of covenants in private credit agreements collecting all covenants from 3,813 contracts.⁸ Importantly, we do not use any text-search program to avoid possible misspecifications in the algorithm.

We record the covenant threshold for each loan for each quarter from origination to final maturity so as to allow for dynamic covenant thresholds in many loans. Furthermore, we find about 80 different descriptions of covenants and classify them, for brevity, into 17 main covenant types.⁹ We also classify covenants into profitability-based covenants and capital-based covenants similar to Christensen and Nikolaev (2012) and comparable to Demerjian (2011). Lenders use capital-based covenants to align incentives ex ante and largely restrict leverage in order to require the firm to keep sufficient net worth and to ensure that firms maintain a specific level of capital within the firm. Profitability-based covenants, on the other hand, are used as a monitoring mechanism to ex-post allocate control rights to the lender (e.g.; Christensen and Nikolaev, 2012; Dyreng et al., 2015; Honigsberg et al., 2015; Hollander and Verriest, 2016). Since they are based on the current performance of the borrower (that is why they are also called performance covenants), lenders can immediately respond to a bad state being reflected in a deteriorating performance of the firm. We further refine the classification scheme of Christensen and Nikolaev (2012) and additionally distinguish capital covenants into leverage, net worth, and short-term covenants.¹⁰ While the first two reflect the focus of the lender on debt amount and leverage, short-term covenants can be considered more as hybrids of profitability and capital covenant, as they (implicitly) address capital but also account for current changes in a borrower's profit performance. Irrespective of the classification, we

⁷ Online Appendix I shows an example of a financial covenant section in a loan contract.

⁸ Note that the sample is substantially larger compared to prior studies which incorporated SEC filings (e.g.; El-Gazzar and Pastena, 1991; Beneish and Press, 1993, 1995; DeFond and Jiambalvo 1994; Sweeney 1994).

⁹ The substantially larger number of covenants can be explained by the variety of definitions of the respective variables. Consider for example a debt to capitalization covenant. Debt can be senior, long term or the total value. Capitalization can refer to net worth plus equity or tangible net worth plus equity.

¹⁰ Note that all covenants included in the capital covenants definition are also included in our leverage, net worth, and short-term covenants. The only difference is that we also include Cash and Cash Equivalents in the short-term covenants, which are not included in the classification of Christensen and Nikolaev (2012).

use the definitions of all 80 covenants to identify covenant violations employing the corresponding information from the company's financial statements.

Using the covenants collected from the SEC filings, we construct several proxies as to the strictness of contracts and covenant violations. We define the Number of Financial Covenants simply as the number of financial covenants in each loan contract. A contract with more covenants is more restrictive compared to a contract with fewer covenants. We measure the covenant tightness in a contract by a "Distance to Covenant Violation" or "DCV" measure, analogous to the "Distance to Default" ("DD") in the credit risk literature. It is calculated by subtracting the covenant threshold from the actual value of the financial covenant and normalizing the absolute value of the result with the standard deviation of the financial covenant, which is derived over the previous 12 quarters at the firm level. The covenant with the lowest DCV of all covenants in a contract determines the contract's DCV, comparable to Prilmeier (2016). The DCV value reflects the number of standard deviations an accounting value/ratio may deteriorate before the covenant threshold is violated. A lower value suggests that the contract has stricter covenants. We also calculate the average DCV of all covenants in a loan contract. For this purpose, we use two aggregation levels. First, we calculate the average DCV of all covenants within each of our 17 main covenant types. We then average again across all main covenant types to calculate our measure. The average DCV accordingly reflects the average number of standard deviations covenants may deteriorate before a contract is violated. A contract with a larger average DCV is less restrictive compared with a contract with a smaller average DCV.^{11,12} We also utilize a Contract Intensity Index that reflects the overall restrictiveness of the loan on the actions of the borrower's management following Bradley and Roberts (2004). The index not only includes financial but also negative covenants. It ranges from zero to

¹¹ Most prior studies only concentrate on specific covenant types when discussing covenant strictness (e.g., Dichev and Skinner, 2002; Chava and Roberts, 2008; Drucker and Puri, 2009; Demiroglu and James, 2010; Nini et al., 2012). Our measure is closest to that proposed in Prilmeier (2016). It is related to Murfin (2012) and Demerjian and Owens (2016) whose measures additionally account for covariances between covenants and incorporate the (multivariate) Normal distribution, in the case of Demerjian and Owens (2016) after simulation of data. Since most firms actively manage accounting data to avoid covenant violations a covenant violation ensures a massive discontinuity in firm type (e.g.; Dichev and Skinner, 2002). This implies that covariances are potentially substantially different between tranquil and stressed periods for a firm. The literature on renegotiation outcomes confirms that firm characteristics substantially change after violations (Chava and Roberts, 2008; Roberts and Sufi, 2009a, b; Nini et al., 2009, 2012) what provides some empirical evidence for this conjecture. Furthermore, the Normal distribution has the shortcoming that it is not able to adequately account for severe jumps in firm characteristics as it is the case when covenants are violated which is addressed to some extent by the simulations in Demerjian and Owens (2016).

¹² Note that using both the DCV (similar to Prilmeier, 2016) and the average DCV accounts for different assumptions regarding correlations between covenants. An example for the calculation of our DCV and average DCV measures is provided in Online Appendix II.

six with high values indicating high contract intensity. It is constructed by adding the indicator variables for dividend restriction, equity sweep, asset sweep, debt sweep, securitization, and a binary variable that is one if the contract includes two or more financial covenants.

A borrower has to comply with most financial covenants on a quarterly basis (Roberts and Sufi, 2009a). A covenant violation constitutes a *technical default*. We calculate whether the borrower complies with the covenants in each quarter after loan origination until the maturity of the loan, also accounting for step-up and step-down provisions. The terms technical default and *covenant violation* are used interchangeably throughout this paper. The variable ‘Days to Contract Violation’ is measured as the difference in time between inception of the contract until the end of the quarter during which a financial covenant is violated for the first time. The variable ‘Days Violation to Subsequent Loan’ measures the number of days from the violation of a contract until the subsequent new loan is initiated.

To construct our final data set, we merge the contracts from EDGAR with several other data sources. We obtain further loan contract information from Dealscan including loan spread (AISD), maturity, loan amount and lender identity. To identify repeated borrowing from the same lender as well as switching between lenders, we construct the merger history for each lender in Dealscan using information obtained from the FDIC and the National Information Center (NIC). Using Robert’s Dealscan-Compustat Linking Database (Chava and Roberts, 2008), we collect quarterly financial statement information from Compustat and merge it to each loan contract. Finally, we obtain borrower default information via the Chapter 11 filings in the UCLA-LoPucki bankruptcy research database. We define a company as being in *default* if it files for either Chapter 7 or 11 and this is recorded in the LoPucki database.¹³ All variables and the calculation of borrower characteristics and financial covenants using Compustat data items are described in Appendix I.¹⁴ The final dataset includes 3,813 loans with 5,411 loan facilities from 1,544 borrowers.¹⁵

¹³ Only 1.4% of all defaults are Chapter 7 (Liquidation), therefore, we do not differentiate between Chapter 7 and Chapter 11 filings and include both cases together in our default measure.

¹⁴ In Appendix I Panel B, we only show examples for the calculation of the financial covenants using Compustat data as there are often many refinements of financial variables included in the actual loan contract.

¹⁵ In the following, we perform our analyses at the facility level. However, we repeat all tests also at the loan level. The results are the same.

2.2 Descriptive Statistics

Table I provides detailed summary statistics on loan and borrower characteristics. All data are measured in real terms with 2000 as the base year. It shows that the average borrower default rate is 2.5%, the average loan facility is \$298 million with an All-In-Spread-Drawn (AISD) of 183 basis points (bps) and 2.55 covenants. The distance to covenant violation (DCV) is 2.58, that is, the strictest covenant can on average change by 2.58 standard deviations before a contract violation occurs.¹⁶ The contract intensity index is derived following Bradley and Roberts (2004) and loans contain, on average, 4.55 out of 6 possible restrictions. Note that we need to rely on data reported by Dealscan when collecting these restrictions. As we require all 6 indicator variables to be observable, but information on some of the negative covenants is missing in many cases, constructing this index reduces the number of observations in our data set by more than 70%. 55% of the loans are violated and these violations occur on average 14 months (427 days) after the loan origination date. Borrowers switch banks in 35.1% of all cases and violate a financial covenant in more than half (57.2%) of all of their prior loan contracts while it takes about 3 years (1,091 days) between a covenant violation and the initiation of the subsequent new loan.

[Table I]

The average borrower size is \$3,291 million with a profitability of 17%, a current ratio of 1.84, a leverage ratio of 0.33, an interest coverage ratio of 15.44, an average 5 year profit trend which lenders might be projecting forward of -0.01, and a market-to-book ratio of 1.68.¹⁷ More than half of the loans are rated and 24.1% are classified as investment and 34.5% as non-investment grade.¹⁸

Panel C of Table I shows the distribution of covenants. More than 60% of all loan contracts contain a Debt to EBITDA covenant followed by Interest Coverage (44%) and Fixed Charge Coverage (42%). Interestingly, while Debt to EBITDA is the most frequently used covenant, Interest Coverage and particularly covenants specifying a maximum level of leverage or a minimum level of net worth (Debt to Capitalization, Debt to Net Worth, Senior Debt to Capitalization) are used for larger loans.

¹⁶ Note that a value of 2.58 implies that a contract might be in violation already after three quarters if the strictest covenant's value only changes by 1 standard deviation towards the threshold in each quarter.

¹⁷ As explained in Appendix I, we derive the 5 year profit trend at the firm level via a regression of the ratio of net income to total assets on a constant and a time trend over the previous 5 years where the coefficient for the time trend reflects our 5 year profit trend. Accordingly, a value of about zero indicates that firms have (on average, deflated) constant profits which do not increase or decrease over time. As a robustness check, we also investigate the results including the 10 year profit trend. The findings are unchanged.

¹⁸ Note that our descriptive statistics are very comparable to Nini et al. (2009) when we use the time period 1996 to 2005 as in their study.

In Table II, we segregate the entire sample based on whether or not the borrower violated a covenant in the prior contract.

[Table II]

Columns (A) and (B) of Table II show mean and median characteristics for borrowers who did not violate a covenant in the prior contract and for those who did. The last column reports the parametric t-statistic (nonparametric z-statistic) of the difference in means (medians) test. Table II shows that the differences between the two groups are substantial. On average, borrowers who have violated a covenant in the prior loan contract have to pay a 98 bps higher spread in the subsequent new loan, accept 0.6 more financial covenants which are in addition significantly more restrictive as measured by their DCV. New loan contracts become stricter after a covenant violation in the prior loan, also reflected in the Contract Intensity Index. The occurrence of profitability-based covenants in subsequent loans increases after violations in the prior loan, while the occurrence of capital-based covenants is slightly lower. Table II also shows that the percentage of secured loans almost doubles. Borrowers who violate covenants are also smaller, higher levered with lower interest coverage and market-to-book ratios and are lower rated.

3. Covenant Violations and Loan Contract Design

In this section we investigate how lenders allocate control rights in new loans after a covenant violation in the previous loan. That is, we examine how loan contract terms change in new loans after covenant violations in the prior loan. We hypothesize that a covenant violation is a signal which induces lenders to act as tough principals in any subsequent new loan by implementing a tougher structure reflected in both price and covenant loan terms. We then provide several tests that help to rule out alternative hypotheses that might explain our findings such as unobservable borrower characteristics, higher ex-ante credit risk of borrowers who have violated covenants in earlier loans, managerial agency problems, potential hold up of borrowers by lenders, or differences in corporate governance.

3.1 Loan Contracting following Covenant Violations in the Prior Loan

In this subsection, we analyze how price and covenant loan terms change in new loans after covenant violations in the prior loan. If covenant violations provide a negative signal that induces lenders

to act as “tough principals” in the subsequent new loan because of borrower stigma, this will be reflected in tougher loan contract terms. More precisely, we expect to find higher loan spreads and more and tighter covenants in new loans. Our basic regression specification has the following form:

$$LCT = a + b * \text{Prior Covenant Violation} + c * \text{Loan Characteristics} \\ + d * \text{Borrower Characteristics} + e * \text{Other Controls} + \varepsilon$$

LCT (‘Loan Contract Terms’) refers to two different groups of dependent variables. The first group contains a common proxy to measure the cost of loans (AISD), the second group describes the new loan’s covenant package as measured by i) the Number of Covenants, ii) the Average Distance to Covenant Violation, iii) the Distance to Covenant Violation and iv) Contract Intensity. The results are reported in Table III.

[Table III]

Table III reports five models with different dependent variables. It also shows the regression methodology used in each regression. In addition to the reported variables, all regressions further include year and industry fixed effects, indicator variables for the different ratings of borrowers at contract initiation, and loan type and loan purpose fixed effects. All variables are defined in Appendix I. Standard errors are robust to heteroscedasticity and clustered at the borrower level.

Column 1 of Table III reports the results of an OLS regression relating AISD to prior covenant violation and our control variables. We find that covenant violations in the prior contract increase loan spreads in the subsequent loan by an average of 18 bps, significant at the 1% level and economically meaningful. It translates into \$0.54 million higher annual loan costs for a borrower who violated a covenant in the prior contract. Most of the other control variables are also highly significant and carry the expected signs. For example, larger loans and loans containing performance pricing grids have lower spreads, secured loans and loans of highly leveraged borrowers carry larger spreads.

We next explore the implications of prior covenant violations on the covenant package of the subsequent new loan. If prior covenant violations are a stigma for borrowers we expect to find that the covenant package overall becomes more restrictive in the subsequent new loan (e.g.; Dewatripont and Tirole, 1994) despite our high number of control variables. Columns 2 to 5 of Table III report the results. First, we relate the number of financial covenants in the new contract to prior covenant violation and our

control variables using ordered logit regressions.¹⁹ We find that a prior violation increases the number of financial covenants used by lenders in the subsequent new loan. The coefficient is significant at the 1% level. The coefficient for loan maturity is positive and significant which is consistent with Rajan and Winton (1995) who argue that long term loans have more covenants. In other words, monitoring via short term debt or via covenants on longer term loans are substitutes. The OLS regression results for the (average) DCV are shown in Column 4 (3). A covenant violation in the prior contract leads to stricter covenants, with thresholds in the subsequent contract set (on average) 1.06 (1.5) standard deviations closer to the actual accounting value at the time the new loan is made. Column 5 in Table III reports the impact of a covenant violation in the prior loan on contract intensity in the subsequent loan using an ordered logit regression. It shows that contract intensity is increasing, the coefficient, however, is only weakly significant. Note that the number of observations drops by almost 70% in Column 5 because we need to rely on data recorded in Dealscan in order to calculate the index in a similar way as in Bradley and Roberts (2004), Demiroglu and James (2010) and Bharath et al. (2011). Information on some of the negative covenants is missing in many cases.

In Panel B we report the results for a first alternative explanation for our findings already in this section for brevity. We include borrower fixed effects to control for unobservable borrower characteristics as suggested in e.g. Nikolaev and van Lent (2005).²⁰ The results remain virtually unchanged. The results for the covenant terms in the subsequent new loan after a violation in the prior loan confirm our earlier findings that lenders act as tough principals after having received a negative signal from the prior project – the number and tightness of covenants significantly increases after a covenant violation in the prior loan contract.

3.2 Alternative Explanations

3.2.1 Alternative Explanations – Borrower Credit Risk after Covenant Violation

An alternative explanation for our results could simply be higher ex-ante credit risk of borrowers who have violated covenants in their prior loan. At the time of a covenant violation at least some of the

¹⁹ We use ordered logit regressions because the number of covenants is an ordinal measure in our context. In robustness tests, we also use OLS models as well as Poisson models and get similar results. We do not report these tests for brevity.

²⁰ The table with all coefficient estimates is provided in the Online Appendix.

borrower's financials are stressed. However, the literature on renegotiation outcomes reveals that the shift in control rights to lenders due to a covenant violation has important implications on borrower risk. In the immediate period after a covenant violation borrowers reduce acquisitions and investments, do not assume further leverage and decrease shareholder payouts, while risk shifting is limited and corporate governance improved (Chava and Roberts, 2008; Roberts and Sufi, 2009a, b; Nini et al., 2009, 2012). Table I shows that subsequent new loans are originated, on average, 3 years (1,091 days) after a covenant violation.

In this subsection, we therefore want to test if covenant violations explain differences in borrower credit risk between violating and non-violating firms in the subsequent years, prior to the initiation of the new loan contract. We investigate borrower risk from two angles.

First, we investigate borrower PD directly. We hypothesize that borrower PD is high at the time of a covenant violation and conditional on not declaring bankruptcy later on, decreases again over the subsequent periods. We augment our loan data with Chapter 11 filings obtained from the UCLA-LoPucki bankruptcy research database which ultimately collects its information from court files or SEC filings. Most importantly, we derive the exact default date of each borrower from LoPucki. We also need a starting point from which we estimate a borrower's PD. If a covenant is violated we take the violation date, if no covenant violation occurs we choose the contract end date as the date for repaying the loan without violating a covenant. Figure 1 plots the default probability²¹ for borrowers after no covenant violation (Figure 1.A) and after a covenant was violated (Figure 1.B).

[Figure 1]

Figure 1.A plots the development of a borrower's PD over time after no covenant has been violated. Directly after the full repayment of the loan borrowers have a PD of almost zero. In line with Flannery (1994), the PD increases (for levered firms) the longer the time period. Figure 1.B plots the development of a borrower's PD over time *after* a covenant violation occurred. Borrowers have, on average, a PD of 30.26% at the first day after the violation (not plotted for scaling purposes). Panel B shows that a borrower's PD is substantially higher in the period immediately following the violation and decreases as a convex function over time. Borrowers exhibit a substantially higher likelihood to default

²¹ In our analyses, we refer to the model-implied PD of a logistic regression model of an indicator variable for default on a dummy for the violation in a past contract, the logarithm of the days since the past contract with no violation or the days since the last violation depending on what occurred lastly, the interaction between these two terms and loan and borrower control variables. We use a logistic model due to its closed form solution which allows for a simple graphical analysis of PD over time.

especially in the first 100 days after a violation. Figure 1 implies that the PD decays to a level comparable with the PD of non-violating borrowers approximately after two years (882 days).

Second, we test if covenant violations predict increases in credit risk. If this is not the case over a longer period, this provides evidence that borrower credit risk between firms, which violate a covenant and those that do not, is not significantly different at the initiation of a new loan.²² We investigate this in more detail in Table IV using various measures of credit risk: borrower default (Panel A), rating downgrade (Panel B), change in net worth (Panel C), change in leverage (Panel D), and the number of subsequent loss making quarters (Panel E).²³

[Table IV]

Regarding borrower default, we define an indicator variable which is one in the year of the default of a borrower and zero otherwise and regress it on past covenant violations and (lagged) control variables. The latter are end of year borrower characteristics and year, industry and rating fixed effects. We investigate the impact of a covenant violation on a firm's default probability in each of the years $t+1$ to $t+5$ after (no) violation using logit regression models. Additionally, we employ a Cox proportional hazards model to address censoring of newer loans to firms in our data set which have less time to go bankrupt. A positive coefficient in this model is indicative of an increase in default probability. Panel A of Table IV shows the results. It reveals that the default probability of borrowers who violate a covenant and those who do not is comparable over the five years following a covenant violation. That is, our variable, covenant violation, does not load in any of the credit risk regressions.²⁴ Note that this predictive analysis of course excludes borrowers which default at the same time when a covenant is violated.

We then investigate rating downgrades using our S&P ratings. We define an indicator variable which is one in the year of a rating downgrade of a borrower and zero otherwise. We follow the same methodology as in Panel A, however, we additionally investigate all results by also including borrower fixed effects to rule out that unobservable borrower characteristics are influencing our findings. Panel B of Table IV shows the results. Excluding borrower fixed effects in columns 2 to 6, we observe that

²² Note that Li et al. (2015) show that at initiation of a contract borrowers with higher risk often receive a grace period with covenants being less restrictive in the first year but becoming tighter over the life of the loan. This suggests that if covenant violations in the prior loan would correspond to higher borrower risk at the initiation of the subsequent new loan we should actually observe a *less* tight financial structure in the new loan after prior covenant violations.

²³ A detailed version of Table IV including all control variables is provided in the Online Appendix.

²⁴ Note that we cannot include borrower fixed effects in these regressions due to missing variation of the dependent variable for non-defaulting firms.

downgrades seem to be more likely in years $t+2$ and $t+3$ after a covenant violation. However, when we control for unobservable borrower characteristics these effects disappear and the probability of being downgraded is comparable for borrowers who violate a covenant and those who do not in the following 5 years. The Cox proportional hazards model in column 1 confirms these findings.

In Panels C and D we investigate the change in borrower net worth (scaled by total assets) and leverage, respectively, from year t to year $t+i$, with i ranging from 1 to 5 years. That is, we calculate for each borrower the difference of net worth and leverage between its value in $t+i$ and its value in t and regress it on our covenant violation indicator variable and control variables using OLS regression models. In both Panels, columns 1 to 5 show the results excluding and in columns 6 to 10 including borrower fixed effects. We observe that in the first 2 years after a covenant violation borrower net worth reduces compared with its value in period t while leverage does not change significantly except with 10% significance in Panel D model 8. It is important to note that new loans are originated, on average, 3 years (1,091 days) subsequent to a covenant violation. Accordingly, we conclude that on average borrower credit risk between those firms that violate a covenant and those that do not is comparable at the initiation of a new loan contract also with respect to borrower leverage and net worth.

Our next test investigates the number of loss making quarters of a firm. In each quarter we count the number of subsequent quarters where the quarterly net income of the borrower is negative. In our regressions we stick to annual control variables for consistency.²⁵ For borrowers with a covenant violation we use control variables in the year prior to the violation year and the number of loss making quarters after the violation, for borrowers with no covenant violation we use control variables at the end of a year and the number of loss making quarters from Q1 of the following year. Panel E shows that irrespective of whether we include borrower fixed effects (column 7) or not (column 2), a covenant violation does not predict the number of subsequent loss making quarters. Also this test allows us to conclude that borrower risk in future periods is not significantly different between firms that violated a covenant in the past loan and those that did not. This is in line with the findings in prior literature and our results in Figure 1 that borrower risk swiftly reduces again back to “regular” levels after a shift in control rights.

²⁵ In all our regression specifications we stick to the standard in the literature and use annual (end of year) control variables to avoid noise in our control variables. However, as mentioned before, we identify and track covenant thresholds and violations in each quarter.

Finally, we investigate refinancing opportunities of borrowers. Refinancing possibilities could be related to borrower risk and this might be reflected in our results. A potential concern could be that some borrowers refinance their existing loans before a violation actually occurs. These borrowers could strategically negotiate different terms for the new, refinanced, loan and therefore avoid violating the covenants of the existing loan. To address this potential concern, we exclude all overlapping loans. That is, we identify any new loan to borrowers, while their existing loans are yet to mature, and drop them from our sample. We repeat our regressions, also including borrower fixed effects, and report the results in Panel F of Table IV. All control variables from Table III are included but not shown for brevity. The results are very similar to those reported earlier. Borrowers with prior violations pay higher spreads, and face more covenants which are on average more restrictive.

3.2.2 Alternative Explanations – Borrower Credit Risk at Loan Initiation

In this sub-section, we provide further tests that seek to rule out that our results are driven by borrower credit risk at the initiation of the new loan. First, we use propensity score matching models following the approach outlined in Rosenbaum and Rubin (1983) and applied in for example Drucker and Puri (2005), Bharath et al. (2011) and Saunders and Steffen (2011). We match borrowers who have violated a covenant to borrowers who did not violate a covenant based on their characteristics at the time of (no) violation. These characteristics include size, profitability, current ratio, leverage, coverage, 5 year profit trend, market-to-book ratio, industry and rating and the number of previous loans. Furthermore, we require the loan characteristics (maturity, size, secured, performance pricing), the loan type and the loan purpose as well as the year of (no) covenant violation to be comparable. We also add the *change* in all borrower characteristics as well as in borrower credit rating from the time of (no) covenant violation until the initiation of the subsequent loan contract to the matching model. This ensures that borrower characteristics and credit rating between violators and non-violators are comparable at the time of (no) violation as well as the change in their characteristics and credit quality is similar until the initiation of the new contract. We use different estimation methods: Nearest Neighbor Matching and Local Linear Regressions (LLR) using both the Gaussian and the Epanechnikov kernel. In contrast to Nearest Neighbor Matching, LLR uses all information from the matched sample weighting the observations based on the

differences in the propensity score between borrowers who violated and those who did not. Table V shows the results.

Panel A of Table V reports the results which are very similar to our other tests. Borrowers who have violated covenants in the prior loan pay higher spreads and face more and stricter covenants in the subsequent loan also when they are matched by their characteristics and their credit quality as well as the change of these until the initiation of the new contract.

[Table V]

Second, we use a regression discontinuity design similar to the approach in Chava and Roberts (2008). We cannot exactly replicate their design because they are able to use quarterly consecutive data in their analysis while we have unbalanced panel data. The basic idea behind a regression discontinuity design is to compare effects between comparable borrowers which only differ in the discontinuity of a covenant violation. Chava and Roberts (2008) investigate the effects of a covenant violation, controlling for borrower characteristics at the time of violation, on capital investment of the firm in the subsequent quarter. If we directly transferred this idea to our setting, we would investigate the effects of a covenant violation, controlling for borrower characteristics at the time of (no) violation, on the contract terms of the subsequent loan which might be initiated several years after the covenant violation. However, borrower characteristics might change substantially over such a long period and we would not compare effects between similar borrowers. We therefore examine the sample of borrowers who have an ongoing loan contract in the year prior to the initiation of the new loan and use the covenant (violation) information of these loans for our analysis.

Intuitively, we investigate price and covenant terms of two similar borrowers who are close to a covenant threshold where one is slightly above and the other slightly below the threshold. That is, if the price and covenant terms are different it is likely only due to the covenant violation. For each new contract, we examine the distance of each covenant in a borrower's prior loan to its respective covenant threshold at the end of the year prior to the initiation of the new loan. In this analysis, we only include borrowers where at least one covenant in the old contract is close to its threshold. For this purpose, we use our DCV measure with a cutoff point of one. That is, we only include contracts with a DCV below 1 at the end of the year prior to the initiation of the new loan (the results for a 0.5 standard deviation as cut-off naturally include fewer observations but are very similar). We then re-estimate the tests from Table III.

The results are reported in Panel B of Table V. All control variables from Table III are included but not shown for brevity. The results are similar to our previous results. Borrowers pay higher spreads and face tighter covenants after having violated covenants in the prior loan consistent with our hypothesis that a covenant violation is a stigma for borrowers which induces lenders to act as tough principals.

3.2.3 Alternative Explanations – Disciplining Effect on Management

An alternative explanation for our results could be that covenant violations are a consequence of self-interested behavior of managers and lenders seek to discipline management after covenant violations. If this is the case we do not expect contract terms to become stricter when shareholders oust their CEO between a covenant violation and the initiation of the new contract. Kaplan and Strömberg (2001, 2003) show that investors intensely screen firms prior to contract initiation especially with respect to management, a standard notion also in the bank lending literature (e.g.; Broeker, 1990; Diamond, 1984, 1991). If management is blamed after covenant violations, we do not expect contract terms to become stricter when the CEO changes prior to the initiation of a new loan contract. In short, we test for the effect of managerial agency problems.

To test this empirically, we enhance our data set with data from ExecuComp and construct a dummy variable, which is one if the CEO changes between the initiation of the prior and the subsequent new contract and zero otherwise. Note that in this analysis we exclude all firms with no information on the CEO in Execucomp. Furthermore, we interact the indicator variable for a change in CEO with prior covenant violation. If management is blamed by lenders after covenant violations we expect the coefficient of the interaction term to be of the reverse sign to that of prior covenant violation and significant. We also follow Eisfeldt and Kuhnen (2013) who identify three reasons for the change in CEO: i.) the CEO was forced to resign, ii.) the CEO retired, and iii.) the reason for the change is unknown. Eisfeldt and Kuhnen provide data from 1992 to 2006, which we update with the reason for the change in CEO provided by ExecuComp for the 2007 to 2010 period. We also build three indicator variables for the reason of the change in CEO and interact these with the prior covenant violation indicator variable.

Panel A in Table VI provides descriptive statistics. It shows the number and percentage of CEO changes for firms included in our data set using data from only ExecuComp from 1996 to 2010 (column 1), only Eisfeldt and Kuhnen data from 1996 to 2006 (column 2), and a combination of both, that is,

Eisfeldt and Kuhnen from 1996 to 2006 with ExecuComp data from 2007 to 2010. Panel A shows that the differences among these data sets are small. About 18% of CEOs resigned, while 30% retired and for 52% the reason for the change in CEO is unknown. Overall, we include 523 changes in CEO (387 when we only use Eisfeldt and Kuhnen's data).

[Table VI]

The multivariate results, including the change in CEO, are shown in Panel B of Table VI.²⁶ Note that due to insufficient observations we cannot estimate the regression for contract intensity. None of the managerial variables interacted with prior covenant violation indicate a disciplining effect on management of a prior covenant violation, that is, the interaction terms of our indicator variables for a change in CEO and prior covenant violation are insignificant. This argues for a stigma of the borrowing firm at the initiation of a new loan when a covenant was violated in the previous loan which is not related to managerial agency problems.

3.2.4 Alternative Explanations – Hold Up

A further alternative explanation for tougher covenant structures after prior loan violations is a hold up of borrowers by banks. Sharpe (1990) and Rajan (1992) argue that information asymmetries allow the existing lender to extract rents from the borrower due to the informational advantage acquired over the lending relationship. The empirical literature provides mixed results with respect to borrowing costs and hold up by banks. While Berger and Udell (1995) find that loan rates decrease over time due to relationship effects, Petersen and Rajan (1994), among others, do not detect a change in rates. In contrast, Degryse and Van Cayseele (2000), and Degryse and Ongena (2005) observe increasing loan rates over the duration of a relationship. We hypothesize that firms with capital market access have access to more funding sources, which allows them to more easily avoid a tougher financial structure after a prior covenant violation.

To test this empirically, we define an indicator variable for debt capital market access which is one if the borrower issues a bond or note of at least USD 10 million between the old and the new bank

²⁶ We show the results using the data of Eisfeldt and Kuhnen from 1996 to 2006 with ExecuComp data from 2007 to 2010, related to column 3 in Panel A of Table VI. Further variations of variables and data source are provided in the Online Appendix.

loan.²⁷ Note that for this test we are able to include only loans granted in the time period 2001 to 2010 as we rely on data from CapitalIQ where information on public debt is available only since 2001. We match these data to our data set and interact the debt capital market access indicator variable with prior covenant violation. If alternative funding sources such as bonds or notes protect borrowers from being held up by banks after covenant violations we would expect the interaction term between prior covenant violations and public debt market access to be of the reverse sign to that of prior violation, and significant. Panel A of Table VII presents the results. We observe that access to public debt markets does not change our previous findings. Lenders act as tough principals after a covenant violation irrespective of capital market access of borrowers to public debt markets. Interestingly, the number of covenants seems to increase after a violation when firms issue bonds and notes in addition to bank debt. Overall, our results argue against a hold up of borrowers after covenant violations.

[Table VII]

3.2.5 Alternative Explanations – Corporate Governance

We next investigate the role of differences in firm governance, that is, institutional (equity) ownership, which might influence our results. Institutional investors are in general held to be more “prudent” what can be explained by statutory and legal restrictions (O'Brien and Bhushan, 1990). Accordingly, the degree of institutional ownership might proxy for (externally) monitoring the potential threat of extracting private benefits as suggested by Amiram and Owens (2012). Banks might therefore implement a less tough financial structure when more shares are held by institutional investors. However, institutional shareholders also hold a convex cash flow claim and could try to increase firm risk after a loan is originated (Dewatripont and Tirole, 1994; Shleifer and Vishny, 1997).

We investigate the impact of institutional ownership via the percentage of institutional shareholders at the initiation of a new loan contract using data from 13f filings which we match to our data set.²⁸ We also interact this variable with our indicator for prior covenant violations. Panel B of Table VII

²⁷ We are aware of a potential selection problem, that is, only good borrowers might self-select to access debt capital markets. However, given that a borrower indeed successfully issues a bond or note although a covenant is violated this appears to be the most unbiased signal of actual access to debt capital markets, and sufficient at least for the purpose of our (robustness) test.

²⁸ In addition to the percentage of institutional shareholders we also investigate the change in institutional shareholdings from the covenant violation (initiation of the prior loan) to the initiation of the new loan contract for

shows that non-price loan contract terms are unaffected by institutional shareholdings. Lenders increase the number and strictness of financial covenants in a new loan contract after borrowers have violated a covenant in a prior loan irrespective of the level of institutional ownership. Interestingly, the loan spread is affected by institutional shareholdings as both prior covenant violation and its interaction term with institutional ownership are statistically significant at the 1% level.

4. Severity and Type of Covenant Violation and Loan Contract Design

4.1 *Covenant Violation Severity*

We are also interested if the severity of a covenant violation has an impact on the loan contract terms of the subsequent new loan. We measure violation severity by the number of the financial covenants that are violated at least once in the prior loan. We hypothesize that the toughness of the financial structure in a new loan contract will increase the greater the violation severity in the prior loan. In other words, we test if there exist differences in stigma which result in different levels of toughness. We investigate this hypothesis with multivariate regression models using the same methodology as in Table III. Table VIII shows the results.

[Table VIII]

We split our prior covenant violation variable using indicator variables for the number of covenants, which are violated in the prior loan contract. The results indicate that as the number of covenant violations increases, lenders implement more and stricter covenants at the initiation of the subsequent new loan. Borrowers also have to pay a higher loan spread the more covenants are violated in the prior contract.

Overall, we conclude that the financial structure of a loan contract becomes tougher the greater the severity of covenant violation in the prior loan. Given that firms often try to manage accounting information so as not to violate covenants (Dichev and Skinner, 2002) and lenders evaluate borrower characteristics and prospects thoroughly before deciding not to renegotiate and allow for a violation (Denis and Wang, 2014), a higher severity reflects a stronger negative signal to future lenders, which

violators (non-violators). Furthermore, we examine the impact of institutional ownership concentration via the Herfindahl-Hirschman Index, related to Liao (2015) but being aware of the potential selection problems of ownership structure as pointed out in Nikolaev (2015b). In addition, we perform all regressions also including borrower fixed effects. The (unreported) results confirm the findings in this subsection in all cases.

induces them to act as increasingly tough principals when allocating control rights in the subsequent new loan.

4.2 Covenant Violation Type

In analyzing the dynamic allocation of control rights over consecutive private debt contracts of the same borrower we are also interested if violations of specific covenants have a different impact on the design of contract terms in the subsequent contract. We follow a two-step procedure and first investigate if violations of different types of covenants have differing effects. Thereafter, we investigate which type of covenant is included conditional on the type of covenant violated. For this purpose, we refine the classification scheme of Christensen and Nikolaev (2012) and split covenants into profitability-based covenants and capital-based covenants where we additionally distinguish the latter between leverage, net worth and short-term covenants. Besides this refinement, we also add the Cash and Cash Equivalents covenant to the short-term covenants which is not included in the general definition of capital covenants. Lenders use capital-based covenants largely to restrict leverage and require the firm to keep sufficient net worth while profitability-based covenants are used especially when accounting signals exhibit a higher correlation with the underlying state of the borrower, such that lenders can immediately respond to a deteriorating performance of the firm. Short term covenants can be considered as a hybrid between capital- and profitability-based covenants as they relate to both covenant types.

To investigate the impact of the violation of a specific type of covenant on loan contract terms we split our variable, prior covenant violation, into violations of profitability-based covenants and violations of capital-based covenants. The results are shown in Table IX.

[Table IX]

Table IX shows that violations of profitability-based covenants induces the lender to act as tough principal in the subsequent new loan by implementing more and tighter covenants and demanding a higher loan spread. The same holds for capital-covenants. We conclude from our findings that a covenant violation results in a stigmatization of the borrower irrespective of the type of covenant violated.

As a next step, we investigate which types of covenants are implemented in a new loan after specific types of covenants are violated in the prior loan. Panel B of Table IX provides some descriptive

statistics.²⁹ It shows the percentage of loan contracts in our data set including a specific covenant for specific types of covenant violation in the prior loan. It reveals that new loan contracts very often again include those covenants which have been violated in the prior contract. For example, after the violation of a profitability-based (capital-based) covenant, 96.46% (68.28%) of subsequent new loans include a profitability-based (capital-based) covenant. This also holds when we further distinguish capital-based covenants into leverage, net worth and short-term covenants. In all cases, more than 50% of new loans also incorporate these covenant types when they have been violated in the prior loan.

We then define several indicator variables which are one if a specific covenant type is included in a loan and zero otherwise. We regress these on prior covenant violations distinguishing by the type of covenant which was violated in the prior loan to identify the effect of a specific type of covenant violation on the probability to include a specific type of covenant in the subsequent new loan contract.³⁰ Furthermore, we investigate the percentage of profitability-based covenants in the new loan after violations of specific types of covenants in the prior loan. Note that our data only include 54 (or 2%) ‘covenant lite’ loans, that is, loans with no covenants. The percentage of capital-based covenants is therefore very close to 1 minus this variable. Accordingly, the results for the percentage of profitability-based covenants are virtually identical (in reverse) to the results for the percentage of capital-based covenants. Consequently, for brevity, we only show our findings for the percentage of profitability-based covenants.

Panel C in Table IX confirms our univariate results from Panel B, that is, lenders increase those covenants which have been violated in the prior contract.³¹ After the violation of a profitability-based covenant the probability that a profitability-based covenant will be included in the subsequent new loan increases while the probability of including a capital-based covenant decreases. Also, the percentage of profitability-based covenants relative to capital-based covenants increases in the new loan. Accordingly, the violation of a performance covenant results in a tendency for lenders to rely increasingly on profitability based covenants. Model 5 illustrates that the overall increase of profitability-based covenants

²⁹ Online Appendix III reports an additional univariate analysis of profitability-based versus capital-based covenants for loans of borrowers that have and have not violated covenants in the prior loan.

³⁰ Note that the results for the number and the probability for including a covenant in a loan contract are virtually the same. For brevity, we therefore only show the results for the probability to include a covenant type.

³¹ Note that this relates to previous literature which shows that lenders often include covenants with the highest accuracy for the respective firm (e.g.; Ball, Bushman, and Vasvari, 2008; Costello and Wittenberg-Moerman, 2011; Demerjian, 2011).

in the covenant mix of the subsequent new loan is about 10%. A comparable pattern can be observed for capital-based covenants. A violation of a capital covenant in the prior loan results in a higher probability to increase a capital-based covenant again in the subsequent loan. This also holds when we further differentiate between leverage, net worth and short-term covenants in model 3. However, the violation of a capital-based covenant in the prior loan does not change the probability of including profitability-based covenants. However, Models 4 and 5 confirm that overall increase of capital-based covenants in the covenant mix of the subsequent new loan is the same as for profitability based covenants with about 10%.³²

In sum, this sub-section shows that the type of covenant violation is irrelevant to lenders regarding the stigma for the borrower. In all cases, lenders implement a tougher financial structure by charging a higher spread and including more and tighter covenants of the type which is also violated in the prior loan contract.

5. The Dynamic Effect of Past Covenant Violations on Future Loan Contract Terms

In this section, we investigate how price and covenant terms change when firms repeatedly borrow in private loan markets. We first graphically explore the dynamics of average loan spreads, number of covenants in loan contracts, the average distance to covenant violation³³, and contract strictness as a function of repeated borrowing in the loan market. Figure 2 shows how the four measures develop over time for borrowers who repeatedly obtain new loans. The number of observations is provided in parentheses.

[Figure 2]

A first time borrower pays on average 178 bps above LIBOR which decreases to 108 bps in its fourth loan contract, conditional on never having violated a covenant. Borrowers become less opaque if they frequently borrow in the loan market. At the same time, violating a covenant in the first three loans

³² In unreported results, we also test the equality of the coefficients between profitability-based covenants and capital-based covenants in model 4 and in model 5 between profitability-based covenants and leverage, net-worth and short-term covenants. All tests cannot reject that the coefficients are the same. In the Online Appendix, we also report further results regarding leverage, net-worth and short-term covenants which provide further confirmation that lenders implement those covenant types which have been violated in the prior contract.

³³ The results for the distance to covenant violation are qualitatively very comparable.

increases loan spreads to 238 bps in the fourth loan. A violation in the first loan increases loan spreads to 228 bps, not violating a covenant in the second loan reduces spreads to 148 bps then in the third loan. Overall, Figure 2 shows that covenant violations result in higher spreads for covenant violating borrowers in subsequent loans.

A similar pattern is observable with respect to the number of financial covenants in new loan contracts. Panel B shows how the average number of the financial covenants develops over time as borrowers return to the loan market for subsequent loans. Not violating covenants reduces the number of covenants in subsequent loans, whereas the number of covenants increases following a covenant violation in the prior loan contract.

Panel C and D show the results for average DCV and contract intensity. The figures depict comparable patterns again. Covenant violations result in stricter average covenant thresholds and contract terms in subsequent loans. Not violating a financial covenant causes average thresholds and contracts to be less strict.

We also explore price and contract terms dynamically over the second and third loan as a function of whether or not the borrower violated a covenant in the prior loan in a multivariate setting.³⁴ Second Loan is an indicator variable equal to one if the borrower has obtained a second loan in our sample period (the first loan is the base case). “Second Loan, Violation in First Loan” is an indicator that is one if the borrower violated a covenant in the first loan. “Third Loan, Violation in Second Loan” is an indicator variable that is one if the borrower violated a covenant in the second loan. The first loan is the base case.³⁵ The fourth (or even later) loans of borrowers are excluded from this analysis due to time-series data limitations. We report the results in Table X.

[Table X]

Table X shows that borrowing without covenant violation has no significant effect on interest rates in the subsequent loan; however, borrowers face less strict covenants (i.e. a higher distance to covenant violation). These benefits accumulate over the second and third loan. Consistent with our earlier findings, after a covenant violation in either the first or the second loan, lenders increase interest rates in

³⁴ Note that Prilmeier (2016) provides a complementary analysis by investigating the effects of relationship duration on non-price loan contract terms.

³⁵ Note that including the first loan as the base case increases the number of observations because we do not require a measure of prior covenant violation to be available for these. Given that potentially some of these loans are issued after prior covenant violations the multivariate results in this section are rather conservative.

the second and third loan. Moreover, they also increase the number of covenants and make them stricter. Note that the inclusion of borrower fixed effects (models 6 to 10) does not change our findings. In the Online Appendix, we present further results related to the severity of covenants violations and repeated borrowing which confirm our previous results also in this setup. Overall, we observe that lenders act as tough principals due to the stigma for borrowers with a covenant violation in the prior loan. This stigma increases and loan contracts become stricter the more often borrowers violate their loan covenants. However, repeated borrowing without violating a covenant reduces the stigma again over time. Accordingly, the “always” in our introductory quote can be relativized to some extent.

6. Covenant Violations and the Supply Side of Capital

In this subsection, we investigate the effect of covenant violations on the size and composition of the lending syndicate in the new loan subsequent to a covenant violation in a prior loan. If the covenant structure implemented by lenders successfully addresses problems such as a stigma due to a prior covenant violation, we expect to find syndicates of similar size in loans to both violating and non-violating borrowers as well as syndicate members willing to make loans of a similar size. We test this using the number of syndicate participants as the dependent variable.

[Table XI]

The results are reported in column (1) of Table XI. We find no significant differences in the number of lenders that participate in syndicates of loans to borrowers who violated a covenant in the prior loan or those who did not. The coefficient of our covenant violation indicator variable is even positive consistent with covenants efficiently allocating control rights and not decreasing lender participation in the primary loan market. Intuitively, larger loans are positively related to the number of lenders. To ensure that our results are not driven by loan size, we scale the number of lenders by the dollar facility amount and run the same specification. We report the results in column (2) and show that the number of lenders relative to the loan amount is also unaffected as contract terms are adjusted.³⁶

Finally, we investigate if the probability to switch to a new lender is different between borrowers who have violated covenants and those that did not. Note that in addition to successfully addressing

³⁶ In robustness checks we also include borrower fixed effects. The results are comparable.

problems such as stigma this also tests if lenders extract “unfair” rents after a violation in the prior contract. If this was the case, we expect to find a higher probability of switching to a new lender. We define Switch as an indicator variable equal to 1 when the borrower did not have a lending relationship with the lead arranger in a new contract for at least 1 year and zero otherwise (e.g.; Ioannidou and Ongena, 2010).³⁷ Column (3) of Table XI reports the results. Borrowers who have violated covenants in the prior loan are neither less nor more likely to switch to new lenders than those who did not violate covenants.

Overall, these results suggest that covenant structure adjustments help to overcome supply side frictions in primary loan markets because control rights are allocated efficiently.

7. Conclusion

Covenants are an important element of loan contracts and can be found in almost every private credit agreement. In this paper, we analyze the effect of covenant violations on the design of the subsequent new loan contract to the same borrower. In particular, we focus on loan contracting as mechanism to allocate control rights efficiently. In line with Dewatripont and Tirole (1994), we contend that lenders have to act as “tough principals” when borrowers have violated covenants in the prior contract due to a stigma attached to it. Overall, we provide empirical evidence consistent with this prediction.

At the heart of our paper is a novel and hand-collected data set of covenants found in 5,411 loan facilities over the 1996 to 2010 period. Our results show that lenders increase loan spreads and implement more and tighter covenants in newly issued loans after a violation in the prior contract consistent with a “tougher financial structure” after a negative signal in the prior loan. We provide arrays of robustness tests to rule out several alternative hypotheses, such as differences in credit quality between violators and non-violators, unobservable borrower characteristics, refinancing opportunities, hold up, borrower governance or disciplining of management after violations. We also observe that lenders implement a tougher financial structure in the subsequent new contract irrespective of the types of violated covenant but increasing in toughness when the severity of covenant violation was more severe in the prior loan. Our results extend over multiple loan contracts. Finally, we document that the number of lenders in syndicates of loans to borrowers that have violated covenants before is insignificantly different from those loans of

³⁷ We use other definitions for Switch in robustness tests and find similar results.

non-violating borrowers. Moreover, we do not find differences in the switching of borrowers with or without prior violations suggesting that covenants help mitigate supply side frictions in primary loan markets.

There are several avenues for future research. First, it would be interesting to compare new bond issuances of borrowers that have violated covenants with bond issuances of non-violating borrowers. Bondholders, due to their more dispersed ownership are less able to monitor and often free-ride. Second, the implications of our findings on the secondary market for loans might be very interesting. For example, how do secondary market prices of loans react when borrowers are found to have violated covenants in a loan that is being traded? Third, an issue also raised by Christensen et al. (2015) is potential cross-country differences in the allocation of control rights dependent on the jurisdiction. Finally, the relationship between financial covenants, performance pricing and loan price deserves further attention. Hopefully, further research will help answering these questions and enhance our understanding on the role of covenants in financial contracting.

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Figure 1
Borrower Default Probability after No Covenant Violation and after a Covenant Violation

The figure shows the probability of default for a borrower not violating a financial covenant (Panel A) and for a borrower violating a financial covenant (Panel B). In Panel A, “Days since Past Contract without Violation” denotes the number of days from the end of a loan contract in which no covenant was violated. In Panel B, “Days since Covenant Violation” represents the number of days from a covenant violation in a loan contract.

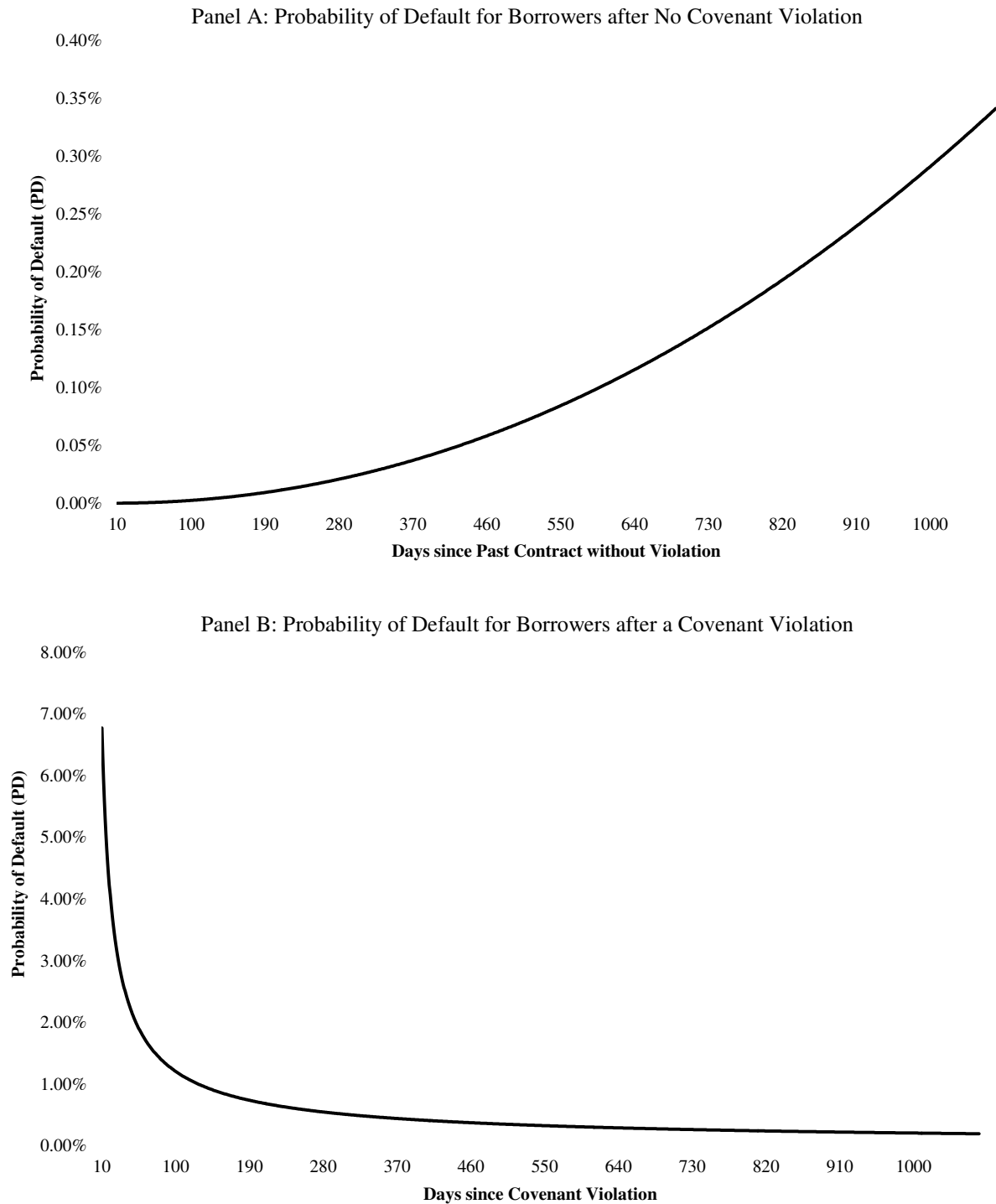
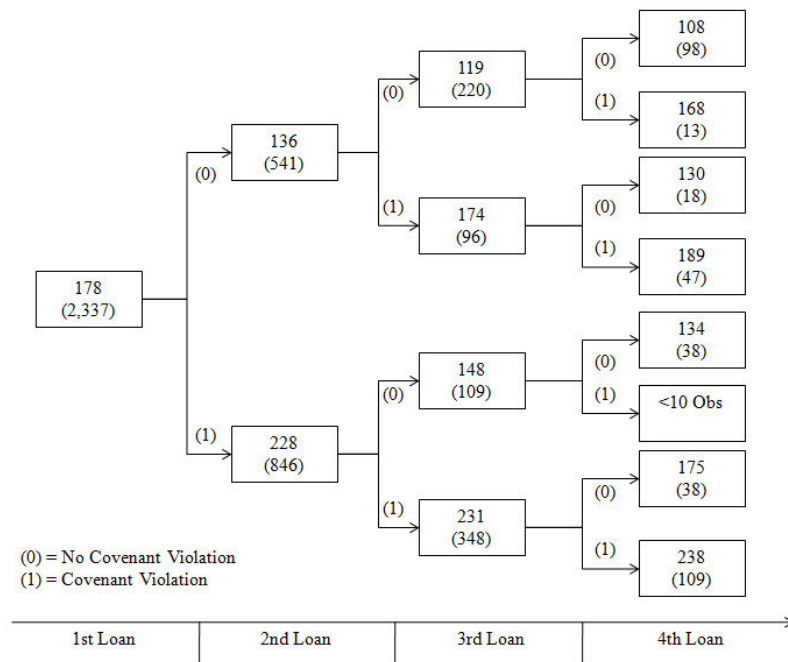


Figure 2

The Dynamic Effect of Past Covenant Violations on Loan Contract Terms

The figure shows how loan contract terms evolve over the number of loans a borrower obtains. It is split into whether a covenant was violated in the prior loan (1) or not (0). The number of loan observations is shown in parentheses. The loan contract terms are the average All-in-Spread-Drawn (Panel A), the number of financial covenants (Panel B), the average distance to covenant violation (Panel C) and the contract strictness (Panel D). The variables are defined in Appendix I.

Panel A: The Effect of Past Covenant Violations on the All-in-Spread Drawn



Panel B: The Effect of Past Covenant Violations on the Number of Covenants

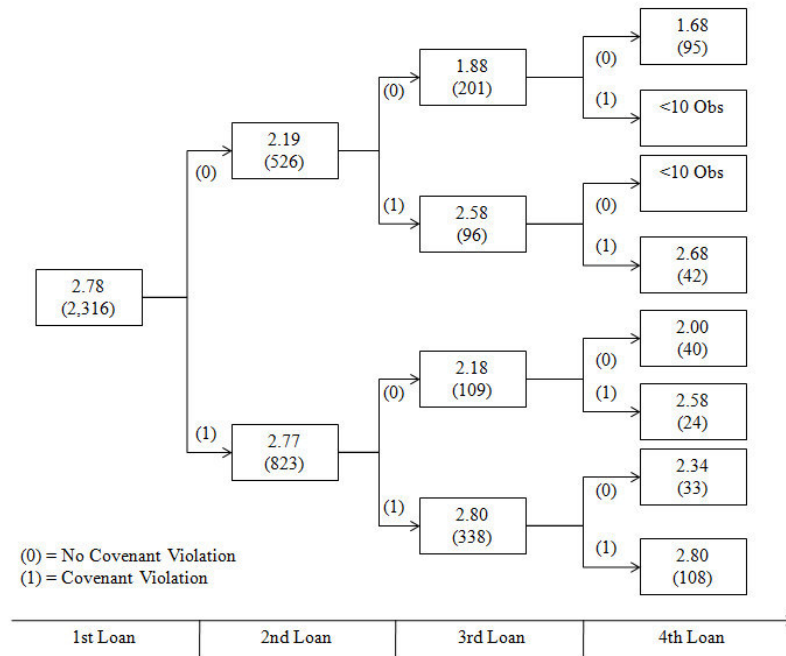
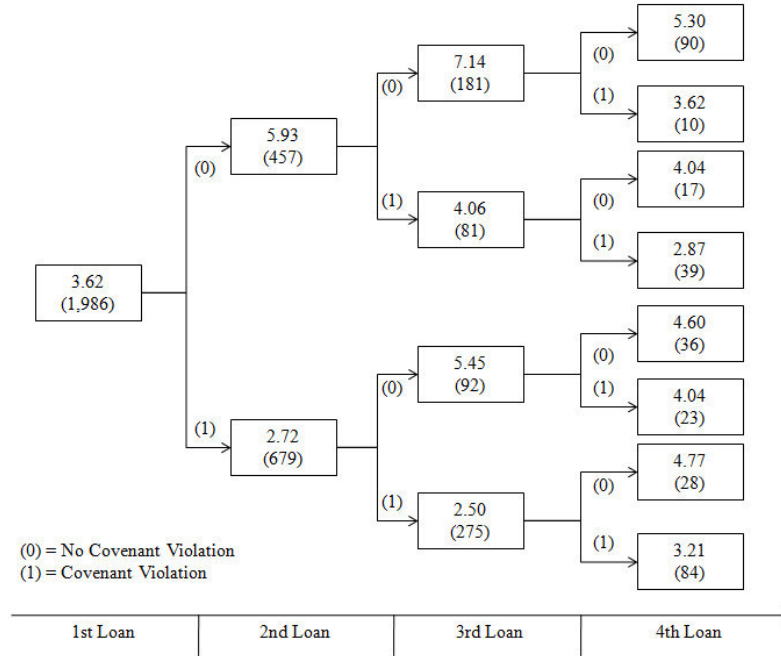


Figure 2 continued
The Dynamic Effect of Past Covenant Violations on Loan Contract Terms

Panel C: The Effect of Past Covenant Violations on the Average Distance to Covenant Violation



Panel D: The Effect of Past Covenant Violations on the Contract Intensity

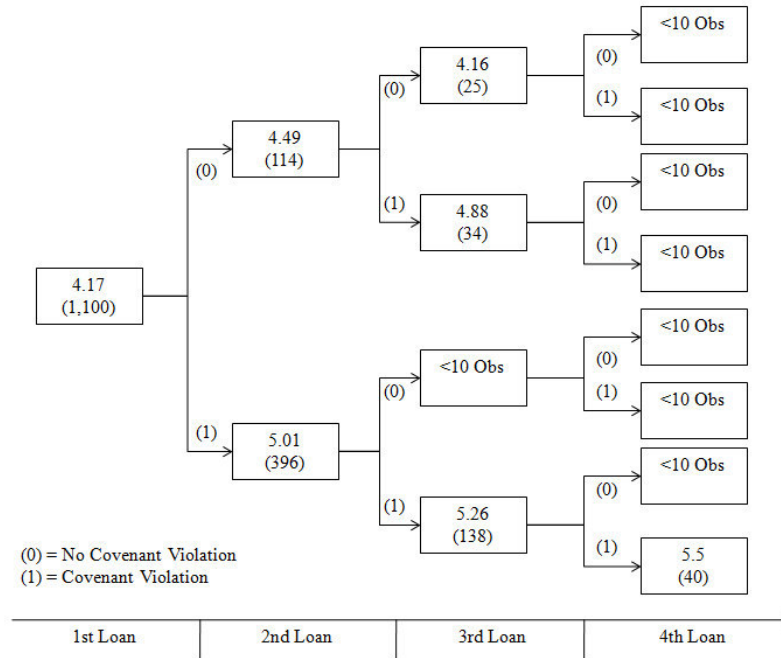


Table I
Descriptive Statistics

The table shows descriptive statistics of loan and borrower characteristics for 5,411 loan facilities originated in the 1996 to 2010 period. Borrower data is from the year prior to loan origination. Detailed definitions of the variables are provided in Appendix 1. All variables are winsorized at the 1% and 99% level.

	Obs.	Mean	Std. Dev.	P 5	Median	P 95
Panel A: Dependent Variables						
All-in-Spread-Drawn	5,315	183	124	30	162	400
Number of Financial Covenants	5,163	2.55	1.16	1	2	4
Average DCV	4,378	3.95	5.75	0.25	2.32	12.21
DCV	4,378	2.58	8.43	0.04	1.25	7.78
Contract Intensity Index	1,985	4.55	1.66	1	5	6
Capital Covenants	5,163	57.7%	49.4%	-	-	-
Profitability Covenants	5,163	87.5%	33.0%	-	-	-
Contract Violation	5,163	55.0%	49.8%	-	-	-
Days to Contract Violation	3,023	427	397	96	288	1223
Default	5,411	2.5%	15.7%	-	-	-
Switch	5,346	35.1%	47.7%	-	-	-
Panel B: Independent Variables						
B.1 Loan Characteristics						
Prior Covenant Violation	2,971	57.2%	49.5%	-	-	-
Number of Covenants Violated	1,699	2.07	1.05	-	-	-
Percentage of Covenants Violated	1,699	72.7%	0.27	-	-	-
Days Violation to Subsequent Loan	1,699	1,091	728	231	918	2,457
Facility Size (Year 2000 USD mm)	5,411	298	415	11	151	1,139
Maturity (Months)	5,349	48	22	12	57	84
Secured	5,371	63.6%	48.1%	-	-	-
Number of Loans	5,411	7.91	6.06	2	6	19
Performance Pricing	5,411	68.8%	46.3%	-	-	-
<u>Loan Purpose in % of Firms</u>						
Corporate	5,411	45.7%	49.8%	-	-	-
Recapitalization	5,411	21.5%	41.1%	-	-	-
Acquisition	5,411	19.9%	39.9%	-	-	-
Back Up	5,411	6.5%	24.7%	-	-	-
Other	5,411	4.9%	21.6%	-	-	-
LBO	5,411	1.6%	12.4%	-	-	-
<u>Loan Type in % of Firms</u>						
Revolver \geq 1 Year	5,411	60.2%	49.0%	-	-	-
Term Loans	5,411	26.3%	44.0%	-	-	-
364 - Day Facility	5,411	9.1%	28.7%	-	-	-
Revolver < 1 Year	5,411	2.1%	14.2%	-	-	-
Bridge Loan	5,411	1.6%	12.6%	-	-	-
B.2 Borrower Characteristics						
Total Assets (Year 2000 USD mm)	5,409	3,291	6,667	65	854	17,155
Profitability	5,376	0.17	0.14	0.01	0.14	0.46
Current Ratio	5,333	1.84	1.12	0.58	1.59	3.83
Leverage	5,401	0.33	0.22	0.007	0.30	0.73
Coverage	5,241	15.44	40.75	0.39	4.48	66.67
5 year Profit Trend	5,389	-0.01	2.93	-4.05	-0.12	4.53
Market to Book	5,330	1.68	0.89	0.85	1.40	3.45
Borrower IPO (Years)	4,476	45	46	1.61	12.96	104.96
<u>Credit Rating</u>						
Investment Grade Rating	5,411	24.1%	42.8%	-	-	-
Non-Investment Grade Rating	5,411	34.5%	47.5%	-	-	-
Not Rated	5,411	41.4%	49.3%	-	-	-

Table I continued
Descriptive Statistics

	Obs.	Mean	Std. Dev.	Loan Amount (\$Bil)		
Panel C: Distribution of Covenants				Average	Median	Total
Debt to EBITDA	5,163	61.70%	48.60%	0.27	0.14	860
Interest Coverage	5,163	44.30%	49.70%	0.34	0.19	778
Fixed Charge Coverage	5,163	41.70%	49.30%	0.18	0.1	388
Net Worth	5,163	23.80%	42.60%	0.26	0.13	319
Debt to Capitalization	5,163	20.00%	40.00%	0.39	0.22	403
Tangible Net Worth	5,163	14.40%	35.10%	0.16	0.07	119
Senior Debt to EBITDA	5,163	13.30%	34.00%	0.22	0.14	151
EBITDA	5,163	11.90%	32.40%	0.11	0.05	68
Current Ratio	5,163	6.90%	25.30%	0.14	0.07	50
Debt Service Coverage	5,163	4.60%	21.00%	0.17	0.08	40
Debt to Net Worth	5,163	4.10%	19.90%	0.42	0.06	88
Quick Ratio	5,163	1.80%	13.40%	0.08	0.04	7
Asset Coverage Ratio	5,163	1.60%	12.60%	0.19	0.14	16
Cash and Cash Equivalents	5,163	1.10%	10.60%	0.21	0.05	12
Senior Debt to Capitalization	5,163	0.90%	9.40%	0.33	0.11	15
Working Capital	5,163	0.80%	8.80%	0.1	0.05	4
Senior Debt to Net Worth	5,163	0.30%	5.70%	0.11	0.05	2

	Obs.	Mean	Std. Dev.	Loan Amount (\$Bil)		
Panel D: Profitability vs. Capital Covenants				Average	Median	Total
Capital Covenants	5,163	0.58	0.49	0.29	0.13	859
Profitability Covenants	5,163	0.88	0.33	0.28	0.14	1,269

Table II**Descriptive Statistics by Covenant Violation in the Prior Loan Contract**

The table shows the mean and median of loan contract terms, and loan and borrower characteristics for granted loans in the time period 1996 to 2010 split into whether a covenant was violated in the prior loan (“Violation”) or no covenant violation (“No Violation”) occurred. The statistical significance of the difference between “Violation” and “No Violation” of each variable is tested via a t-test and a Wilcoxon rank sum test where the last two columns provide the corresponding t- and z-statistic. All variables are defined in Appendix 1. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

	No Violation		Violation		(A) - (B)	
	(A) Mean	Median	(B) Mean	Median	t-statistics	z-statistics
Panel A: Dependent Variables						
Default	0.008	0	0.041	0	-5.350***	-5.330***
All-in-Spread-Drawn	131	100	229	220	-21.920***	-23.140***
Number of Financial Covenants	2.02	2	2.62	3	-15.030***	-14.600***
Average DCV	5.82	3.76	2.84	1.78	13.108***	18.101***
DCV	3.96	2.67	1.64	1.01	12.861***	17.381***
Contract Intensity Index	4.57	5	5.12	5	-5.340***	-4.430***
Capital Covenants	0.66	1	0.56	0	4.225***	5.107***
Profitability Covenants	1.31	1	2.01	2	-18.508***	-16.848***
Switch	0.20	0	0.28	0	-5.160***	-5.140***
Panel B: Independent Variables						
B.1 Loan Characteristics						
Facility Size (Year 2000 USD mm)	428	252	287	155	8.670***	10.600***
Maturity (Months)	44.0	50.0	51.0	60.0	-8.730***	-7.520***
Secured	0.40	0	0.79	1	-23.200***	-21.330***
Number of Loans	10.46	9	9.44	8	4.286***	4.796***
Performance Pricing	0.73	1	0.63	1	6.273***	6.232***
<u>Loan Purpose in % of Firms</u>						
Corporate	0.61	1	0.48	0	7.340***	7.270***
Recapitalization	0.10	0	0.16	0	-4.430***	-4.410***
Acquisition	0.09	0	0.25	0	-11.530***	-11.280***
Back Up	0.12	0	0.02	0	11.090***	10.870***
Other	0.04	0	0.05	0	-1.64	-1.64
LBO	0.02	0	0.02	0	-0.51	-0.51
<u>Loan Type in % of Firms</u>						
Revolver ≥ 1 Year	0.64	1	0.56	1	4.380***	4.360***
Term Loans	0.16	0	0.36	0	-11.680***	-11.430***
364 - Day Facility	0.15	0	0.04	0	9.910***	9.750***
Revolver < 1 Year	0.02	0	0.02	0	0.48	0.48
Bridge Loan	0.02	0	0.02	0	0.77	0.77
B.2 Borrower Characteristics						
Total Assets (Year 2000 USD mm)	5,737	2,161	2,938	907	10.510***	13.530***
Profitability	0.18	0.16	0.17	0.14	1.920**	3.510***
Current Ratio	1.68	1.50	1.71	1.53	-0.98	-1.37
Leverage	0.28	0.26	0.38	0.37	-13.470***	-13.800***
Coverage	17.96	6.68	10.01	3.57	6.460***	15.550***
5 year Profit Trend	0.14	0.01	-0.11	-0.12	2.263**	4.282***
Market to Book	1.68	1.41	1.57	1.33	6.740***	5.990***
Borrower IPO (Years)	50	17	42	13	4.640***	6.240***
<u>Credit Rating</u>						
Investment Grade Rating	0.47	0	0.13	0	21.530***	20.030***
Non-Investment Grade Rating	0.24	0	0.53	1	-16.850***	-16.100***
Not Rated	0.29	0	0.34	0	-2.290**	-2.280**

Table III**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan**

The table reports results from multivariate regressions of various price and non-price loan contract terms on prior covenant violation and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity. Prior covenant violation is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. All variables are described in Appendix 1. In Model (5) “Secured” is excluded as it is part of the dependent variable. Panel B uses the same specification as Panel A and additionally includes borrower fixed effects. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Prior Covenant Violation	17.716*** (3.892)	0.413*** (0.108)	-1.521*** (0.343)	-1.057*** (0.208)	0.458* (0.241)
<i>Loan Characteristics</i>					
Ln(Maturity in Months)	-14.028** (6.204)	0.371** (0.148)	0.514* (0.275)	0.094 (0.194)	0.680*** (0.230)
Secured	51.577*** (5.533)	0.014 (0.130)	-0.913* (0.471)	-0.413 (0.359)	
Log (Facility Size)	-12.322*** (2.373)	0.023 (0.057)	-0.258* (0.136)	-0.276** (0.139)	-0.156 (0.127)
Ln(Number of Loans)	4.108 (4.205)	-0.213 (0.131)	-0.130 (0.375)	-0.256 (0.254)	-0.253 (0.281)
Performance Pricing	-39.961*** (4.691)	0.354*** (0.123)	0.494** (0.246)	0.047 (0.192)	0.160 (0.232)
<i>Borrower Characteristics</i>					
Profitability	-0.539** (0.230)	0.005 (0.005)	-0.007 (0.013)	0.006 (0.006)	0.010 (0.009)
Current Ratio	-0.064*** (0.025)	0.001 (0.001)	0.004* (0.002)	0.001 (0.002)	-0.002 (0.001)
Leverage	0.684*** (0.145)	0.003 (0.004)	-0.026*** (0.009)	-0.024*** (0.006)	0.002 (0.006)
Coverage	-0.001** (0.001)	0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000** (0.000)
5 year Profit Trend	0.110 (0.984)	0.011 (0.025)	-0.032 (0.045)	-0.051 (0.032)	-0.043 (0.034)
Market to Book	-0.119*** (0.028)	0.000 (0.001)	0.002 (0.003)	0.006*** (0.002)	-0.005*** (0.002)
Log (Total Assets)	-5.219* (2.812)	-0.377*** (0.074)	0.376* (0.220)	0.541*** (0.174)	-0.212 (0.151)
Constant	483.372*** (41.437)	YES	17.451*** (4.126)	1.024 (2.384)	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,786	2,709	2,272	2,272	848
R ²	0.664	0.165	0.221	0.179	0.186

Table III continued
Dynamic Loan Contracting Following Covenant Violations in the Prior Loan

Panel B: Including Borrower Fixed Effects	(1)	(2)	(3)	(3)	(4)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Prior Covenant Violation	7.698** (3.143)	0.176** (0.074)	-1.383*** (0.265)	-0.858*** (0.154)	-0.130 (0.217)
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Borrower Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,786	2,709	2,272	2,272	848
R ²	0.853	0.580	0.752	0.715	0.761

Table IV

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

The table reports results from multivariate regressions of different dependent variables. These are a default indicator variable (Panel A), a rating downgrade indicator variable (Panel B), the change in firm net worth to total assets (Panel C), the change in firm leverage (Panel D), the number of subsequent loss making quarters excluding the current quarter (Panel E), and the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity (Panel F). Borrower and loan characteristics are as in Table III. Covenant Violation in Panels A to E is a dummy variable equal to one if the borrower violates a financial covenant in year t . Panels A to F use annual data where for the determination of the dependent variable in Panel E we use quarterly data. Prior covenant violation in Panel F is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. Model (1) in Panels A and B reports results from a Cox proportional hazards model. The remaining models in both Panels show regressions of the respective dependent variable on (lagged) control variables. Panels C and D show regressions of differences of the respective dependent variable between year $t+x$ and year t on control variables in year $t-1$. Panel E uses the number of subsequent loss making quarters as dependent variable excluding the current quarter. In years with no financial covenant violation this is the number of loss making quarters after Q4 of the respective year, in years with financial covenant violation the control variables are used in Q4 of the previous year and the number of loss making quarters is calculated as the loss quarters after the violation. Panel F reports results as in Table III but excludes all overlapping loans of each borrower, that is, new loans that are originated while existing loans have not yet matured. In Models (5) and (10) “Secured” is excluded as it is part of the dependent variable. All variables are described in Appendix 1. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Event	Event in t+1	Event in t+2	Event in t+3	Event in t+4	Event in t+5	Event in t+1	Event in t+2	Event in t+3	Event in t+4	Event in t+5
Regression Methodology	Hazard Model	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit
Panel A: Default											
Covenant Violation	-0.269 (0.654)	0.567 (0.485)	-0.396 (0.605)	0.196 (0.529)	-0.942 (1.121)	0.359 (0.654)					
Panel B: Rating Downgrade											
Covenant Violation	0.208 (0.172)	0.179 (0.141)	0.294** (0.123)	0.253* (0.132)	0.185 (0.154)	0.134 (0.199)	0.059 (0.184)	0.238 (0.180)	0.281 (0.208)	0.121 (0.272)	0.122 (0.557)
		Change from t to t+1	Change from t to t+2	Change from t to t+3	Change from t to t+4	Change from t to t+5	Change from t to t+1	Change from t to t+2	Change from t to t+3	Change from t to t+4	Change from t to t+5
Regression Methodology		OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Panel C: Net Worth / Total Assets											
Covenant Violation		-0.628 (0.405)	-1.349** (0.644)	-0.142 (0.783)	-0.795 (0.983)	-1.088 (1.241)	-0.940** (0.438)	-1.629** (0.644)	-0.517 (0.702)	-1.075 (0.833)	-1.413 (0.946)
Panel D: Leverage											
Covenant Violation		0.201 (0.331)	0.594 (0.531)	-0.031 (0.673)	0.371 (0.810)	0.404 (1.023)	0.490 (0.361)	0.878* (0.532)	0.412 (0.611)	0.903 (0.693)	0.860 (0.761)
Panel E: The Effect of Covenant Violation on the number of subsequent loss making quarters											
Covenant Violation		0.064 (0.096)					0.101 (0.089)				
Borrower Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Borrower Fixed Effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table IV continued
Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

Panel F: Excluding Overlapping Loans	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS		Ordered Logit	OLS	Ordered Logit	OLS		Ordered Logit
Prior Covenant Violation	23.934*** (5.144)	0.358** (0.144)	-2.361*** (0.485)	-1.252*** (0.237)	0.335 (0.368)	18.573*** (5.673)	0.294** (0.147)	-2.173*** (0.442)	-1.037*** (0.218)	0.045 (0.115)
Loan Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Borrower Fixed Effects	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	1517	1463	1189	1189	428	1517	1463	1189	1189	428
R ²	0.664	0.144	0.269	0.208	0.245	0.929	0.645	0.831	0.789	0.817

Table V**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk – Matching and Regression Discontinuity**

The table reports results from a propensity score matching model (Panel A) and multivariate regressions (Panel B) of various price and non-price loan contract terms. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity. Prior covenant violation is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. Panel A shows results from propensity score matching using a nearest neighbor estimator with 10, 50 and 100 nearest neighbors together with a Gaussian and an Epanechnikov kernel estimator with a bandwidth of 0.01. The propensity score is calculated using a probit regression of covenant violation on all control variables from Table III in addition to changes in the borrower characteristics variables in Table III, the change in facility size, and the change in borrower rating from the time of covenant violation until the initiation of the subsequent new contract. If there is no covenant violation, the same variables' changes are calculated from the contract end date of the unviolated contract until the initiation of the subsequent new contract. In parentheses bootstrapped standard errors are reported using 50 replications. Panel B reports the results from a regression discontinuity analysis. It only includes these new loans where in the prior contract the distance of at least one covenant to its respective covenant threshold is at maximum 1 standard deviation in the year prior to the new loan contract, that is, the distance to covenant violation is in the interval (-1; 1) in the year before the new contract is initiated. All variables are described in Appendix 1. In Model (5) "Secured" is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A. Propensity Score Matching	(1)	(2)	(3)	(4)	(5)
	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Prior Covenant Violation (Nearest Neighbor (n=10))	37.014** (14.437)	0.316*** (0.115)	-0.708** (0.323)	-0.450* (0.269)	0.405 (0.296)
Prior Covenant Violation (Nearest Neighbor (n=50))	46.272*** (9.149)	0.298*** (0.089)	-0.843*** (0.265)	-0.539*** (0.186)	0.401** (0.173)
Prior Covenant Violation (Nearest Neighbor (n=100))	54.658*** (8.832)	0.189** (0.076)	-1.001*** (0.245)	-0.684*** (0.251)	0.407** (0.201)
Prior Covenant Violation (Gaussian)	24.624*** (10.173)	0.315** (0.133)	-0.703** (0.322)	-0.507* (0.271)	0.408* (0.246)
Prior Covenant Violation (Epanechnikov)	43.983*** (13.582)	0.356** (0.153)	-1.038*** (0.363)	-1.077*** (0.350)	0.432 (0.355)

Panel B. Regression Discontinuity	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Prior Covenant Violation	21.278** (9.973)	0.186 (0.258)	-0.556** (0.243)	-0.251** (0.127)	Insufficient Observations
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	726	715	592	592	
R ²	0.545	0.164	0.203	0.213	

Table VI**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Managerial Agency Problems**

The table reports descriptive statistics of changes in CEO data (Panel A) as well as results from multivariate regressions of different dependent variables (Panel B). The latter are the All-in-Spread-Drawn, the number of financial covenants, the average distance to covenant violation (DCV) and the DCV. Results for the contract intensity are not reported due to insufficient observations. Prior covenant violation is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. The change in CEO data is derived from ExecuComp and amended with the reason why the CEO left the firm from Eisfeldt and Kuhnen (2013) available at Andrea L. Eisfeldt's personal website for the period 1992 to 2006. Panel A shows the number and percentage of changes in CEO by the reason why the CEO left the firm using only the classifications from ExecuComp over 1996 to 2010 in column (1), using only the classifications from Eisfeldt and Kuhnen (2013) over 1996 to 2006 in column (2), and using the classifications from Eisfeldt and Kuhnen (2013) over 1996 to 2006 and the classifications from ExecuComp from 2007 to 2010 in column (3). All regressions in panel B include variables defined as in Panel A column (3) and the control variables from Table III described in Appendix 1. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A	(1)	(2)	(3)
Data Source	Only ExecuComp	Only Eisfeldt and Kuhnen (2013)	Eisfeldt and Kuhnen (2013) and ExecuComp
Resigned / Forced Turnover	99 18.929%	61 15.762%	93 17.782%
Retired	179 34.226%	111 28.682%	157 30.019%
Unknown /Unclassified Turnover	245 46.845%	215 55.556%	273 52.199%
Total Number of CEO Changes	523	387	523

Panel B	(1)	(2)	(3)	(4)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV
Regression Methodology	OLS	Ordered Logit	OLS	OLS
Prior Covenant Violation	17.199*** (5.139)	0.386*** (0.150)	-1.346*** (0.486)	-1.202*** (0.331)
Change in CEO - Resigned	30.450** (12.210)	-0.185 (0.351)	1.329 (1.546)	0.250 (1.220)
Change in CEO - Retired	1.599 (8.563)	0.384 (0.270)	0.424 (0.811)	-0.515 (0.657)
Change in CEO - Unknown	-1.042 (6.885)	-0.165 (0.231)	1.144 (1.006)	0.657 (0.850)
Prior Covenant Violation *	-28.662 (19.025)	-0.330 (0.639)	-3.558* (2.100)	-2.085 (1.416)
Change in CEO - Resigned	-5.805 (15.344)	-0.415 (0.454)	1.292 (1.349)	1.094 (0.875)
Prior Covenant Violation *	-9.709 (10.252)	0.176 (0.339)	-0.827 (1.179)	-0.332 (0.940)
Change in CEO - Unknown				
Control Variables	YES	YES	YES	YES
Number of Observations	1,948	1,904	1,612	1,612
R ²	0.711	0.189	0.238	0.185

Table VII**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Debt Capital Market Access and Institutional Ownership**

The table reports results from multivariate regressions of various price and non-price loan contract terms on prior covenant violation and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity. Prior covenant violation is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. In Panel A, Debt Capital Market Access is a dummy variable if the firm issued a bond or a note with a notional of at least \$10 million between the prior and the new loan. The regressions in Panel A include data from 2001 to 2010 because the latter variable is derived using Capital IQ where information on firm debt is included only from 2001 on. In Panel B, Institutional Ownership (%) indicates the percentage of institutional owners of the firm at the initiation of the new loan derived from 13f filings. All variables are described in Appendix 1. In Model (5) “Secured” is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A: DCM Access	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Prior Covenant Violation	22.217*** (6.903)	0.114 (0.172)	-1.705** (0.700)	-0.846* (0.447)	0.242 (0.485)
Debt Capital Market Access	-4.733 (5.930)	-0.150 (0.154)	-0.382 (0.570)	0.281 (0.418)	-0.084 (0.566)
Prior Covenant Violation *	-9.291 (8.321)	0.440** (0.218)	0.504 (0.708)	-0.309 (0.525)	0.242 (0.644)
Capital Market Access					
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,305	2,236	1,888	1,888	574
R ²	0.679	0.166	0.247	0.177	0.184

Panel B: Institutional Ownership	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Prior Covenant Violation	25.074*** (4.588)	0.353*** (0.133)	-1.743*** (0.434)	-1.166*** (0.275)	0.499* (0.289)
Institutional Ownership (%)	3.409 (7.537)	-0.265 (0.210)	-0.726 (0.635)	-0.573 (0.583)	0.105 (0.568)
Prior Covenant Violation *	-30.090*** (9.921)	0.269 (0.269)	0.916 (0.758)	0.476 (0.621)	-0.256 (0.684)
Institutional Ownership (%)					
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,786	2,709	2,272	2,272	848
R ²	0.667	0.165	0.222	0.180	0.188

Table VIII**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan - Violation Severity**

The table reports results from multivariate regressions of various price and non-price loan contract terms on prior covenant violation and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity. “X Covenant(s) Violated” is the number of covenants violated in the prior loan contract. All variables are described in Appendix 1. In Model (5) “Secured” is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
<i>Prior Covenant Violation</i>					
1 Covenant Violated	5.284 (4.793)	0.188 (0.129)	-1.432*** (0.384)	-1.039*** (0.268)	0.285 (0.292)
2 Covenants Violated	22.867*** (5.783)	0.358** (0.160)	-1.433*** (0.409)	-1.124*** (0.215)	0.433 (0.293)
3 Covenants Violated	31.537*** (7.385)	0.849*** (0.219)	-1.918*** (0.410)	-0.895*** (0.232)	0.907*** (0.329)
4 or more Covenants Violated	51.608*** (10.965)	1.920*** (0.324)	-2.078*** (0.463)	-1.409*** (0.286)	0.464 (0.630)
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,786	2,709	2,272	2,272	848
R ²	0.671	0.177	0.223	0.18	0.192

Table IX**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Type of Covenant Violation and Type of Covenant included**

The table reports in Panel B descriptive results and in Panel A and C results from multivariate regressions of various price and non-price loan contract terms on the type of prior covenant violation and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity. Each type of prior covenant violation is indicated by a dummy variable equal to one if the borrower violated at least one covenant of this financial covenant type in the prior loan contract. Profitability-based and capital-based covenants are defined following Christensen and Nikolaev (2012). Violation Profitability Covenant indicates violations of EBITDA, Debt to EBITDA, Debt Service Coverage Ratio, Fixed Charge Coverage Ratio, Interest Coverage Ratio or Senior Debt to EBITDA covenants in the prior loan; Violation Capital Covenant includes violations of Asset Coverage Ratio, Current Ratio, Debt to Capitalization, Debt to Net Worth, Net Worth, Quick Ratio, Senior Debt to Capitalization, Senior Debt to Net Worth, Tangible Net Worth, Working Capital covenants; Violation Leverage Covenant includes Debt to Capitalization and Senior Debt to Capitalization covenants; Violation Net Worth Covenant includes Debt to Net Worth, Net Worth, Senior Debt to Net Worth and Tangible Net Worth covenants; Violation Short-term Covenant includes Asset Coverage Ratio, Current Ratio, Quick Ratio, Working Capital, Cash and Cash Equivalents covenants. Note that Cash and Cash Equivalents are neither classified as profitability nor as capital covenants in Christensen and Nikolaev (2012), but are included in our classification of Short-term Covenants. All variables are described in Appendix 1. In Model (5) in Panel A “Secured” is excluded as it is part of the dependent variable. Panel B shows the percentage of contracts including a (1) Profitability covenant, (2) Capital Covenant, (3) Leverage Covenant, (4) Net Worth Covenant and (5) Short-term Covenant given that the covenant type mentioned in the first column was violated in the prior loan. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A: Violated Covenant Type	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
<i>Prior Covenant Violation</i>					
Violation Profitability Covenant	15.753*** (4.190)	0.350*** (0.121)	-1.270*** (0.393)	-0.651*** (0.206)	0.531** (0.240)
Violation Capital Covenant	19.077*** (5.330)	0.397*** (0.147)	-1.035*** (0.265)	-0.680*** (0.165)	0.167 (0.267)
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,786	2,709	2,272	2,272	848
R ²	0.667	0.167	0.224	0.178	0.189

Table IX continued

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Type of Covenant Violation and Type of Covenant included

Panel B: Percentage of Contracts Including a Covenant Type conditional on having violated a Specific Covenant Type in the Prior Contract					
	(1)	(2)	(3)	(4)	(5)
	Profitability Covenant	Capital Covenant	Leverage Covenant	Net Worth Covenant	Short-term Covenant
<i>Prior Covenant Violation</i>					
Violation Profitability Covenant	96.49%	40.62%	7.58%	29.57%	48.31%
Violation Capital Covenant	89.86%	68.28%	23.46%	40.90%	48.15%
Violation Leverage Covenant	80.39%	71.08%	55.14%	26.17%	46.26%
Violation Net Worth Covenant	92.39%	63.04%	13.28%	53.39%	39.84%
Violation Short-term Covenant	91.56%	77.92%	16.56%	31.29%	65.64%
Panel C: Included Covenant Type by violated Covenant Type					
	(1)	(2)	(3)	(4)	(5)
	Profitability Covenant	Capital Covenant	Capital Covenant	Percentage of Profitability Covenants	Percentage of Profitability Covenants
Regression Methodology	Logit	Logit	Logit	OLS	OLS
Violation Profitability Covenant	1.194*** (0.272)	-0.638*** (0.149)	-0.612*** (0.149)	0.107*** (0.018)	0.107*** (0.018)
Violation Capital Covenant	-0.203 (0.280)	1.170*** (0.175)		-0.084*** (0.019)	
Violation Leverage Covenant			1.081*** (0.332)		-0.082** (0.036)
Violation Net Worth Covenant			0.890*** (0.204)		-0.070*** (0.022)
Violation Short-term Covenant			0.795* (0.412)		-0.072** (0.035)
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2497	2497	2497	2693	2693
R ²	0.365	0.236	0.232	0.343	0.344

Table X**The Dynamic Effect of Past Covenant Violations on Loan Contract Terms**

The table reports results from multivariate regressions of various price and non-price loan contract terms on covenant violations and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity as well as in Panel C the percentage of profitability covenants. The regressions segregate the sample into different time periods reflecting the sequence of loans of individual borrowers. Second (Third) Loan is an indicator variable for the second (third) loan, the first loan is the base case. “Second Loan, Violation in First Loan” (Third Loan, Violation in Second Loan) is an indicator variable equal to 1 if the borrower has violated a covenant in the first (second) loan and obtains the second (third) loan. All variables are described in Appendix 1. In Models (5) and (10) “Secured” is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Second Loan	-6.435 (4.118)	-0.199* (0.114)	1.704*** (0.449)	0.957** (0.377)	0.081 (0.264)	-5.973 (3.980)	-0.202 (0.123)	1.963*** (0.440)	1.121*** (0.360)	0.003 (0.183)
Second Loan, Violation in First Loan	17.259*** (5.069)	0.352** (0.139)	-1.780*** (0.440)	-1.110*** (0.354)	0.138 (0.298)	13.720*** (4.420)	0.153** (0.063)	-1.961*** (0.421)	-1.321*** (0.369)	-0.380 (0.239)
Third Loan	-7.888 (5.739)	-0.153 (0.134)	2.304*** (0.637)	1.592*** (0.503)	-0.052 (0.347)	-8.219 (5.162)	-0.085 (0.102)	2.336*** (0.704)	1.732*** (0.588)	-0.035 (0.295)
Third Loan, Violation in Second Loan	12.213* (6.761)	0.348** (0.161)	-2.402*** (0.644)	-1.677*** (0.454)	0.279 (0.380)	10.874* (5.756)	0.147** (0.064)	-2.484*** (0.603)	-1.800*** (0.544)	0.154 (0.359)
Loan Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Borrower Fixed Effects	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	4145	4074	3472	3472	1684	4145	4074	3472	3472	1684
R ²	0.626	0.132	0.185	0.121	0.193	0.850	0.531	0.756	0.770	0.582

Table XI
Covenant Violations, Relationships and Loan Liquidity

The table reports results from multivariate regressions using various dependent variables. These are the (1) number of lenders, (2) number of lenders over facility size, and (3) switch. All variables are described in Appendix I. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

	(1)	(2)	(3)
Dependent Variable	Number of Lenders	Number of Lenders / Facility Size	Switch
Regression Methodology	OLS	OLS	Logit
Prior Covenant Violation	0.224 (0.443)	0.003 (0.004)	0.122 (0.148)
<i>Loan Characteristics</i>			
Ln(Maturity in Months)	1.654*** (0.498)	-0.006 (0.005)	0.200 (0.146)
Secured	0.730 (0.512)	0.013** (0.005)	0.191 (0.172)
Log (Facility Size)	2.132*** (0.189)		-0.150** (0.061)
Ln(Number of Loans)	0.621 (0.397)	0.001 (0.004)	-0.259* (0.153)
Performance Pricing	1.862*** (0.378)	-0.005 (0.005)	-0.085 (0.136)
<i>Borrower Characteristics</i>			
Profitability	-0.005 (0.020)	0.000 (0.000)	0.001 (0.006)
Current Ratio	-0.002 (0.002)	0.000** (0.000)	0.000 (0.001)
Leverage	0.009 (0.011)	0.000 (0.000)	0.003 (0.004)
Coverage	-0.000 (0.000)	-0.000* (0.000)	0.000** (0.000)
5 year Profit Trend	-0.017 (0.048)	-0.001 (0.001)	-0.023 (0.026)
Market to Book	0.002 (0.003)	-0.000** (0.000)	-0.002* (0.001)
Log (Total Assets)	1.552*** (0.261)	-0.014*** (0.002)	-0.189** (0.088)
Constant	-25.293*** (4.299)	0.162*** (0.040)	2.733** (1.186)
Year Fixed Effects	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
Rating Fixed Effects	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES
Number of Observations	2,826	2,826	2,779
R ²	0.405	0.148	0.1073

Appendix I

Variable Definitions

Panel A Variable	Description	Source
<i>DEPENDENT VARIABLES</i>		
Default	Dummy variable equal to one if the borrower defaults.	UCLA Bankruptcy
All-in-Spread-Drawn	All-in-Spread-Drawn (in bps) is the coupon spread over LIBOR plus one time fees on the drawn portion of the loan.	LPC Dealscan
Number of Financial Covenants	Number of financial covenants per contract.	SEC Filings
Average Distance to Covenant Violation (Average DCV)	For each covenant, the slack at loan origination is normalized by the covenant's standard deviation. Slack is the (absolute) difference between the actual value derived from accounting data and the covenant value. The covenant's standard deviation is derived from accounting data over the previous 12 quarters. The about 80 individual covenants are consolidated to 1 value per contract using 2 aggregation levels. First, the average within each of the 17 different financial covenant types defined below is calculated. Second, the average across these 17 covenant types is derived. The average DCV reflects how many standard deviations accounting variables and ratios can change on average before covenants are violated.	Own Calculation
Distance to Covenant Violation (DCV)	For each covenant, the slack at loan origination is normalized by the covenant's standard deviation. Slack is the (absolute) difference between the actual value derived from accounting data and the covenant value. The covenant's standard deviation is derived from accounting data over the previous 12 quarters. The smallest value of all covenants included in the contract is the DCV. It reflects how many standard deviations the accounting variable/ratio with the smallest distance to violation can change before the contract is violated.	Own Calculation
Contract Intensity	Index according to Bradley and Roberts (2004) ranging from 0 to 6. It is calculated as the sum of indicator variables for dividend restriction, asset-, equity-, debt sweep, secured, and 2 financial covenants or more.	LPC Dealscan
Number of Profitability Covenants	The number of profitability-based covenants following Christensen and Nikolaev (2012).	SEC Filings
Number of Capital Covenants	The number of capital-based covenants following Christensen and Nikolaev (2012).	SEC Filings
Percentage of Profitability Covenants	The percentage of profitability based covenants following Christensen and Nikolaev (2012) defined as profitability covenants / (profitability covenants + capital covenants).	Own Calculation
Contract Violation	Dummy variable equal to one if the borrower violates at least one of the financial covenants in the loan agreement.	Own Calculation
Days to Contract Violation Switch	Days from contract initiation date until the first financial covenant violation. Dummy variable equal to one for the first loan from this lender or if the borrower did not obtain a loan from the same lender over at least one year after the prior loan from this lender matured.	Own Calculation LPC Dealscan, NIC
<i>INDEPENDENT VARIABLES</i>		
<i>Loan Characteristics</i>		
Prior Covenant Violation	Dummy variable equal to one if the borrower violated a covenant in the prior loan of our sample.	Own Calculation
Percentage of Covenants Violated	Number of covenants the borrower violated in the prior loan of our sample divided by the total number of financial covenants in this contract.	Own Calculation
Change in CEO	Dummy variable equal to one if the CEO of the borrowing firm changes in the period from a covenant violation in the prior contract (initiation of the prior contract) until the initiation of the new contract when the borrower did (not) violate a covenant in the prior contract.	Execucomp
Facility Size	Facility amount of the loan in year 2000 \$ million.	LPC Dealscan
Maturity (Months)	Maturity of the loan in months.	LPC Dealscan
Secured	Dummy variable equal to one if the loan is secured.	LPC Dealscan
Number of Loans	Number of loans the respective borrower has since the introduction of LPC Dealscan in 1987.	LPC Dealscan
Performance Pricing	Dummy variable equal to one, if the loan contains a performance pricing grid.	LPC Dealscan
Days Violation to Subsequent Loan	Number of days from a covenant violation to the initiation of the subsequent new loan.	Own Calculation
<i>Loan Purpose</i>		
Corporate	Dummy variable equal to one, if the loan issuance purpose is "General" in the database.	LPC Dealscan
Recapitalization	Dummy variable equal to one, if the loan issuance purpose is "Recapitalization" in the database.	LPC Dealscan
Acquisition	Dummy variable equal to one, if the loan issuance purpose is "Acquisition" in the database.	LPC Dealscan
LBO	Dummy variable equal to one, if the loan issuance purpose is "Leveraged Buy Out" in the database.	LPC Dealscan
Back Up	Dummy variable equal to one, if the loan issuance purpose is "Back Up" in the database.	LPC Dealscan
Other	Dummy variable equal to one, if the loan issuance purpose is "Other" in the database.	LPC Dealscan

Appendix I continued

Variable Definitions

Panel A Variable	Description	Source
<i>Loan Characteristics continued</i>		
<u>Loan Type</u>		
Revolver < 1 Year	Dummy variable equal to one, if the loan type is "Revolver < 1 Year" in the database.	LPC Dealscan
Revolver ≥ 1 Year	Dummy variable equal to one, if the loan type is "Revolver ≥ 1 Year" in the database.	LPC Dealscan
Bridge Loan	Dummy variable equal to one, if the loan type is "Bridge Loan" in the database.	LPC Dealscan
364 - Day Facility	Dummy variable equal to one, if the loan type is "364 - Day Facility" in the database.	LPC Dealscan
Term Loan	Dummy variable equal to one, if the loan type is "Term Loan" in the database.	LPC Dealscan
<i>Borrower Characteristics</i>		
Total Assets	Total assets of the borrower in year 2000 \$ million.	Compustat
Profitability	Ratio of EBITDA to sales.	Compustat
Current Ratio	Ratio of current assets to current liabilities.	Compustat
Leverage Ratio	Ratio of book value of total debt to book value of total assets.	Compustat
5 year Profit Trend	The trend of net income to total assets over the last 5 years of the firm. It is derived via a regression of net income to total assets on a constant and a time trend and reflected by the latters' coefficient. For its derivation, data starting in 1991 is used.	
Coverage	Ratio of EBITDA to interest expenses.	Compustat
Market to Book	Ratio of the sum of book value of liabilities and market value of equity to book value of total assets.	Compustat
Borrower IPO (Years)	Years since the IPO of the borrower.	Compustat
Young	Dummy variable equal to one, if the borrower IPO date is less than 3 years ago.	Compustat
Small	Dummy variable equal to one, if the borrower is within the first quantile in year 2000 \$ million asset size.	
<u>Rating</u>		
Investment Grade Rating	Dummy variable equal to one, if the borrower's S&P long-term issuer rating is BBB- or better.	LPC Dealscan
Non-Investment Grade Rating	Dummy variable equal to one, if the borrower's S&P long-term issuer rating is BB+ or worse.	LPC Dealscan
Not Rated	Dummy variable equal to one, if the borrower is not rated by S&P.	LPC Dealscan
<i>Financial Covenants</i>		
Asset Coverage Ratio	Current Assets to Liabilities	SEC Filings
Cash and Cash Equivalents	Cash and Cash Equivalents	SEC Filings
Current Ratio	Current Assets to Current Liabilities	SEC Filings
Debt Service Coverage Ratio	EBITDA to Interest Expense and Principal Payment	SEC Filings
Debt to Capitalization	Debt to Capitalization (Total Debt and Equity)	SEC Filings
Debt to EBITDA	Debt to EBITDA	SEC Filings
Debt to Net Worth	Debt to Net Worth	SEC Filings
EBITDA	EBITDA	SEC Filings
Fixed Charge Coverage Ratio	EBITDA to Interest Expense, Principal Payment, Income Tax and Dividend on Preferred Stock	SEC Filings
Interest Coverage Ratio	EBITDA to Interest Expense	SEC Filings
Net Worth	Net Worth	SEC Filings
Quick Ratio	Current Assets minus Inventory to Current Liabilities	SEC Filings
Senior Debt to Capitalization	Senior Debt to Capitalization (Total Debt and Equity)	SEC Filings
Senior Debt to EBITDA	Senior Debt to EBITDA	SEC Filings
Senior Debt to Net Worth	Senior Debt to Net Worth	SEC Filings
Tangible Net Worth	Tangible Net Worth	SEC Filings
Working Capital	Current Assets minus Current Liabilities	SEC Filings
Profitability Covenants	Debt to EBITDA, Debt Service Coverage Ratio, EBITDA, Fixed Charge Coverage Ratio, Interest Coverage Ratio, Senior Debt to EBITDA	
Capital Covenants	Asset Coverage Ratio, Current Ratio, Debt to Capitalization, Debt to Net Worth, Net Worth, Quick Ratio, Senior Debt to Capitalization, Senior Debt to Net Worth, Tangible Net Worth, Working Capital	
Leverage Covenant	Debt to Capitalization, Senior Debt to Capitalization	
Net Worth Covenant	Debt to Net Worth, Net Worth, Senior Debt to Net Worth, Tangible Net Worth	
Short-term Covenant	Asset Coverage Ratio, Current Ratio, Quick Ratio, Working Capital, Cash and Cash Equivalents	

Appendix I continued

Variable Definitions

Panel B Variable	Compustat Code	Source
<i>Borrower Characteristics</i>		
Total Assets	atq	Compustat
Profitability	oibdpq [4 qrt] / saleq [4 qrt]	Compustat
Current Ratio	actq / lctq	Compustat
Leverage Ratio	(dlttq+dlcq)/atq	Compustat
Coverage	oibdpq [4 qrt] / xintq [4 qrt]	Compustat
Market to Book	((prccq*cshoq)- (atq-ltq+txditcq) + atq) / atq	Compustat
Borrower IPO (Years)		Compustat
<i>Financial Covenants</i>		
Debt Service Coverage Ratio	oibdpq [4 qrt] / (xintq [4 qrt] + dltry [4 qrt] - dltisy [4 qrt])	SEC Filings
Fixed Charge Coverage Ratio	oibdpq [4 qrt] / (xintq [4 qrt] + dltry [4 qrt] - dltisy [4 qrt] + txtq [4 qrt] + dvpq [4 qrt])	SEC Filings
Interest Coverage Ratio	oibdpq [4 qrt] / xintq [4 qrt]	SEC Filings
Debt to Capitalization	(dlttq + dlcq) / (dlttq + dlcq + seqq)	SEC Filings
Senior Debt to Capitalization	(dlttq + dlcq - ds) / (dlttq + dlcq + seqq)	SEC Filings
Debt to EBITDA	(dlttq + dlcq) / oibdpq [4 qrt]	SEC Filings
Senior Debt to EBITDA	(dlttq + dlcq - ds) / oibdpq [4 qrt]	SEC Filings
Debt to Net Worth	(dlttq + dlcq) / seqq	SEC Filings
Senior Debt to Net Worth	(dlttq + dlcq - ds) / seqq	SEC Filings
Current Ratio	actq / lctq	SEC Filings
Asset Coverage Ratio	actq / ltq	SEC Filings
Quick Ratio	actq - invtq / lctq	SEC Filings
Net Worth	seqq	SEC Filings
Tangible Net Worth	seqq - intanq	SEC Filings
EBITDA	oibdpq [4 qrt]	SEC Filings
Working Capital	actq - lctq	SEC Filings
Cash and Cash Equivalents	cheq	SEC Filings

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Online Appendix

Online Appendix I

SECTION 7.10. Certain Financial Covenants.

(a) Debt Ratio. The Borrower will not permit the Debt Ratio to exceed the following respective ratios at any time during the following respective periods:

Period	Ratio
-----	-----
From the date hereof through August 31, 2000	4.75 to 1
From September 1, 2000 through August 31, 2001	4.50 to 1
From September 1, 2001	4.25 to 1
and at all times thereafter	4.00 to 1

(b) Senior Debt Ratio. The Borrower will not permit the Senior Debt Ratio to exceed the following respective ratios at any time during the following respective periods:

Period	Ratio
-----	-----
From the date hereof through February 29, 2000	3.75 to 1
From March 1, 2000 through August 31, 2000	3.50 to 1
From September 1, 2000	3.00 to 1
and at all times thereafter	2.50 to 1

(c) Interest Coverage Ratio. The Borrower will not permit the Interest Coverage Ratio to be less than the following respective ratios at any time during the following respective periods:

Period	Ratio
-----	-----
From the date hereof through August 31, 2000	2.25 to 1
From September 1, 2000 through August 31, 2001	2.00 to 1
From September 1, 2001	1.75 to 1
and at all times thereafter	1.50 to 1

(d) Fixed-charges Ratio. The Borrower will not permit the Fixed-charges Ratio to be less than 1.00 to 1 as at the last day of any fiscal quarter of each fiscal year.

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Online Appendix II

Company Name: Gray Communications Systems

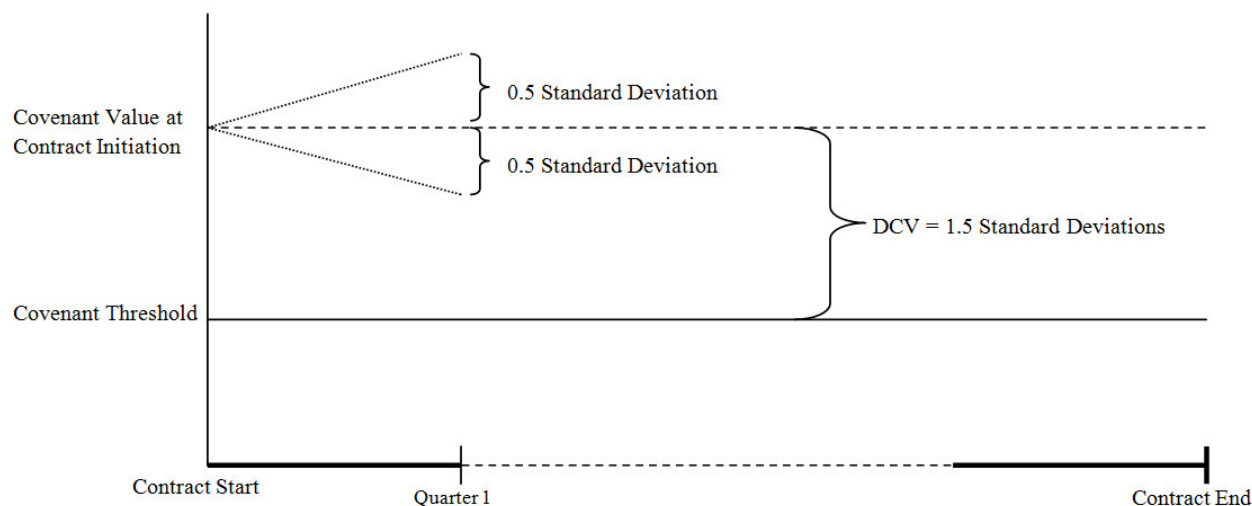
Deal active date: July 31, 1998

Financial Covenant Type	Covenant Definition in Loan Contract	Threshold Type	Covenant Threshold	Slack scaled by Standard Deviation	Average by Main Financial Covenant Type
Debt Service Coverage Ratio	Cash Flow to Interest and Principal Payment	Min.	1.1	2.763	2.763
Senior Debt to EBITDA	Senior Debt to Cash Flow	Max.	4.25	0.531	0.531
Fixed Charge Coverage Ratio	Cash Flow to Interest, Principal Payment, Income Taxes and Capital Expenditures	Min.	1	0.942	0.942
Interest Coverage Ratio	Cash Flow to Interest and Capital Distribution	Min.	1.5	0.637	0.637
Debt to EBITDA	Total Debt to Cash Flow	Max.	6.9	0.191	0.159
Debt to EBITDA	Total Debt - Cash and Marketable Securities to Cash Flow	Max.	6.75	0.127	
Average Distance to Covenant Violation					1.0064
Distance to Covenant Violation				0.127	

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Online Appendix II continued

Exemplified Contract with a DCV of 1.50 of a Min. Threshold Type Covenant



As an example for our covenant looseness measure consider the covenants in Gray Communications Systems' loan contract on July 31st, 1998. It contains 6 covenants in 5 main covenant types:

- i. an adjusted debt service coverage ratio of 1.1,
- ii. a senior debt to adjusted EBITDA ratio of 4.25,
- iii. an adjusted fixed charge coverage ratio of 1,
- iv. an adjusted interest coverage ratio of 1.5,
- v. a debt to adjusted EBITDA ratio of 6.9, and
- vi. an adjusted debt to adjusted EBITDA ratio of 6.75,

where the two latter both belong to the Debt to EBITDA covenant main type. "Adjusted" refers to any definition different from the variable on a stand-alone basis.

We derive the slack between each accounting variable as calculated prior to the loan and the specified covenant threshold in the loan contract and divide it by the financial covenant's standard deviation, derived over the previous 12 quarters. The accounting value for the adjusted debt service coverage ratio which is the cash flow to interest and principal payment on July 31st, 1998 is 1.62. Subtracting the covenant threshold of 1.1 and dividing the result by a standard deviation of 0.1882 gives a value of 2.763. It reflects the fact that the Cash Flow to Interest and

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Principal Payment ratio may decrease 2.763 times its standard deviation of 0.1882, i.e. by 0.52, before the covenant is violated. A covenant is violated if the corresponding accounting value is above (a max. threshold type) or below (a min. threshold type) its respective threshold. The calculation for the other covenants follows the same approach.

The distance to covenant violation (DCV) is determined by the lowest value of all slacks scaled by the standard deviation. For the average DCV, these values are aggregated up to their main financial covenant type. Accordingly, the values for debt to adjusted EBITDA of 0.191 and adjusted debt to adjusted EBITDA ratio of 0.127 are averaged to 0.159 for the Debt to EBITDA main covenant type, where the remaining covenants all belong to different main types. Finally, the average DCV of 1.0064 is derived as the mean of all five main financial covenant types.

We provide another example showing our DCV measure graphically. It shows a contract with a DCV of 1.5. This implies that the financial value / ratio of the strictest covenant in a contract may deteriorate by 1.5 of its standard deviation before a contract is violated over its maturity. Given that after contract initiation this ratio would consecutively move in each quarter towards its threshold by 0.5 of its standard deviation this would accordingly imply that in the third quarter the financial value / ratio would be equal to the specified threshold in the contract and in the fourth quarter the contract would be in violation.

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Online Appendix III

Profitability-Based versus Capital-Based Covenants

This table shows univariate results of these covenants split into whether a covenant was violated in the prior loan (“Violation”) or no covenant violation (“No Violation”) occurred. The statistical significance of the difference, shown in the third column, between “Violation” and “No Violation” of each variable is tested via a t-test and a Wilcoxon rank sum test where the last two columns provide the corresponding t- and z-statistic.

Panel A: Profitability-based vs. capital-based covenants	No Violation	Violation	Difference		
	(A)	(B)	(A) - (B)	(A) - (B)	
	Mean	Mean	Mean	t-statistics	z-statistics
<u>Profitability Covenants</u>	1.312	2.014	-0.707***	-18.557***	-16.833***
Debt Service Coverage	0.012	0.037	-0.026***	-4.542***	-4.203***
Debt to EBITDA	0.497	0.709	-0.212***	-11.572***	-11.457***
EBITDA	0.048	0.131	-0.083***	-7.940***	-7.394***
Fixed Charge Coverage	0.244	0.494	-0.250***	-14.222***	-13.461***
Interest Coverage	0.457	0.445	0.012	0.637	0.637
Senior Debt to EBITDA	0.055	0.198	-0.143***	-11.991***	-10.906***
<u>Capital Covenants</u>	0.665	0.555	0.109***	4.225***	5.107***
Asset Coverage Ratio	0.006	0.017	-0.011***	-2.823***	-2.630***
Current Ratio	0.023	0.063	-0.040***	-5.301***	-4.951***
Debt to Capitalization	0.298	0.124	0.174***	11.199***	11.450***
Debt to Net Worth	0.038	0.012	0.026***	4.175***	4.473***
Net Worth	0.187	0.206	-0.019	-1.235	-1.228
Quick Ratio	0.013	0.007	0.006*	1.483*	1.544*
Senior Debt to Capitalization	0.005	0.004	0.001	0.244	0.247
Senior Debt to Net Worth	0.002	0.002	0.000	0.004	0.004
Tangible Net Worth	0.087	0.113	-0.026**	-2.276**	-2.237**
Working Capital	0.004	0.006	-0.002	-0.762	-0.741

Addition to Table III, Panel B**Dynamic Loan Contracting Following Covenant Violations in the Prior Loan**

The table reports results from multivariate regressions of various price and non-price loan contract terms on prior covenant violation and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity. Prior covenant violation is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. All variables are described in Appendix 1. In Model (5) “Secured” is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Including Borrower Fixed Effects	(1)	(2)	(3)	(3)	(4)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Prior Covenant Violation	7.698** (3.143)	0.176** (0.074)	-1.383*** (0.265)	-0.858*** (0.154)	-0.130 (0.217)
<i>Loan Characteristics</i>					
Ln(Maturity in Months)	-6.034 (7.447)	0.223 (0.263)	0.112 (0.374)	0.180 (0.312)	0.282 (0.363)
Secured	38.303*** (10.684)	0.520 (0.326)	0.265 (0.713)	0.433 (0.481)	
Log (Facility Size)	-8.179*** (2.802)	0.025 (0.071)	-0.245* (0.145)	-0.188 (0.146)	-0.062 (0.069)
Ln(Number of Loans)	8.739 (21.604)	-0.033 (0.681)	-2.029 (1.528)	-0.947 (1.382)	-1.476 (3.436)
Performance Pricing	-31.581*** (5.632)	0.314* (0.184)	0.082 (0.370)	0.131 (0.430)	0.051 (0.282)
<i>Borrower Characteristics</i>					
Profitability	-0.417 (0.729)	0.003 (0.015)	0.003 (0.028)	-0.018 (0.031)	0.041 (0.076)
Current Ratio	0.008 (0.050)	-0.000 (0.002)	0.008* (0.004)	0.004 (0.004)	0.001 (0.010)
Leverage	0.778*** (0.240)	-0.000 (0.012)	-0.047** (0.018)	-0.044*** (0.016)	-0.006 (0.051)
Coverage	-0.001 (0.001)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
5 year Profit Trend	-0.601 (1.546)	0.055 (0.055)	0.097 (0.139)	0.030 (0.074)	0.056 (0.182)
Market to Book	-0.189*** (0.071)	-0.001 (0.002)	0.001 (0.006)	0.006 (0.005)	-0.000 (0.012)
Log (Total Assets)	-14.381* (7.985)	-0.344 (0.307)	0.322 (0.545)	0.539 (0.461)	-0.086 (1.489)
Constant	486.668*** (87.461)	YES	7.574 (6.930)	-2.859 (6.132)	YES
Borrower Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	2,786	2,709	2,272	2,272	848
R ²	0.853	0.580	0.752	0.715	0.761

Addition to Table IV

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

The table reports results from multivariate regressions of different dependent variables. These are a default indicator variable (Panel A), a rating downgrade indicator variable (Panel B), the change in firm net worth to total assets (Panel C), the change in firm leverage (Panel D), and the number of subsequent loss making quarters excluding the current quarter (Panel E). Borrower and loan characteristics are as in Table III. Covenant Violation in Panels A to E is a dummy variable equal to one if the borrower violates a financial covenant in year t . Panels A to E use annual data. Model (1) in Panels A and B reports results from a Cox proportional hazards model. The remaining models in both Panels show regressions of the respective dependent variable on (lagged) control variables. Panels C and D show regressions of differences of the respective dependent variable between year $t+x$ and year t on control variables in year $t-1$. Panel E uses the number of subsequent loss making quarters as dependent variable excluding the current quarter. In years with no financial covenant violation this is the number of loss making quarters after Q4 of the respective year, in years with financial covenant violation the control variables are used in Q4 of the previous year and the number of loss making quarters is calculated as the loss quarters after the violation. All variables are described in Appendix 1. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A: Default	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Default	Default in t+1	Default in t+2	Default in t+3	Default in t+4	Default in t+5
Regression Methodology	Hazard Model	Logit	Logit	Logit	Logit	Logit
Covenant Violation	-0.269 (0.654)	0.567 (0.485)	-0.396 (0.605)	0.196 (0.529)	-0.942 (1.121)	0.359 (0.654)
<i>Borrower Characteristics</i>						
Profitability	-0.159 (1.127)	-2.985* (1.526)	-2.702 (1.671)	-1.505 (1.697)	-1.307 (1.722)	-1.250 (2.509)
Current Ratio	0.448*** (0.120)	-0.962 (0.687)	0.051 (0.184)	0.190 (0.126)	0.317** (0.145)	0.131 (0.328)
Leverage	8.173*** (1.287)	11.895*** (1.918)	5.002*** (0.968)	2.396*** (0.878)	3.715*** (0.964)	2.920*** (1.104)
Coverage	-0.026 (0.016)	-0.046 (0.078)	-0.007 (0.012)	-0.005 (0.014)	0.000 (0.009)	0.006 (0.007)
5 year Profit Trend	-0.224*** (0.040)	-0.055 (0.050)	-0.142*** (0.046)	-0.078** (0.039)	0.008 (0.061)	0.009 (0.059)
Market to Book	-1.371** (0.576)	-4.992*** (1.079)	-2.423*** (0.605)	-0.885* (0.515)	-0.690 (0.635)	-0.886** (0.449)
Log (Total Assets)	0.817*** (0.108)	0.509*** (0.110)	0.538*** (0.099)	0.581*** (0.106)	0.516*** (0.117)	0.454*** (0.132)
Constant	NO	-25.347*** (2.248)	-9.995*** (1.820)	-10.305*** (1.772)	-11.285*** (2.219)	-23.415*** (1.965)
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES
Number of Observations	16,213	12,663	11,772	10,646	9,031	7,510
R ²		0.427	0.248	0.161	0.150	0.146

Addition to Table IV continued

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

Panel B: Rating Downgrade	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent Variable	Downgrade	Downgrade in t+1	Downgrade in t+2	Downgrade in t+3	Downgrade in t+4	Downgrade in t+5	Downgrade in t+1	Downgrade in t+2	Downgrade in t+3	Downgrade in t+4	Downgrade in t+5
Regression Methodology	Hazard Model	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit
Covenant Violation	0.208 (0.172)	0.179 (0.141)	0.294** (0.123)	0.253* (0.132)	0.185 (0.154)	0.134 (0.199)	0.059 (0.184)	0.238 (0.180)	0.281 (0.208)	0.121 (0.272)	0.122 (0.557)
<i>Borrower Characteristics</i>											
Profitability	-1.369*** (0.373)	-1.851*** (0.385)	-1.135*** (0.396)	-0.817* (0.446)	-0.723 (0.479)	-0.486 (0.553)	-3.348*** (0.800)	-2.786*** (0.960)	-2.945** (1.241)	-3.413** (1.412)	-1.080 (2.265)
Current Ratio	0.086 (0.054)	0.134** (0.055)	0.204*** (0.052)	0.249*** (0.058)	0.275*** (0.065)	0.304*** (0.076)	0.021 (0.113)	0.046 (0.121)	0.109 (0.152)	0.214 (0.183)	0.216 (0.205)
Leverage	1.784*** (0.376)	1.925*** (0.364)	1.611*** (0.376)	1.332*** (0.406)	1.212*** (0.449)	1.174** (0.484)	5.215*** (0.736)	4.114*** (0.892)	3.578*** (1.081)	3.204** (1.525)	2.578 (1.913)
Coverage	0.002 (0.004)	0.001 (0.004)	-0.002 (0.003)	-0.004 (0.003)	-0.004 (0.003)	-0.002 (0.004)	-0.002 (0.007)	-0.002 (0.006)	-0.003 (0.006)	-0.007 (0.008)	0.006 (0.009)
5 year Profit Trend	-0.036* (0.021)	-0.037** (0.018)	-0.023 (0.019)	-0.013 (0.019)	-0.010 (0.020)	0.001 (0.022)	-0.048** (0.023)	-0.077*** (0.029)	-0.087*** (0.034)	-0.102** (0.042)	-0.104* (0.058)
Market to Book	-0.627*** (0.110)	-0.890*** (0.120)	-0.668*** (0.102)	-0.517*** (0.094)	-0.469*** (0.094)	-0.496*** (0.099)	-1.608*** (0.254)	-1.029*** (0.207)	-0.593*** (0.218)	-0.218 (0.234)	-0.010 (0.247)
Log (Total Assets)	-0.015 (0.049)	-0.016 (0.044)	-0.017 (0.047)	-0.035 (0.054)	-0.068 (0.060)	-0.104 (0.069)	-0.189 (0.233)	0.214 (0.269)	0.584* (0.340)	0.481 (0.449)	0.218 (0.601)
Constant		-1.616*** (0.535)	-1.129** (0.546)	-0.666 (0.602)	0.069 (0.668)	0.654 (0.751)	1.428 (1.734)	0.605 (1.920)	0.249 (2.402)	5.170 (3.153)	17.586*** (4.386)
Borrower Fixed Effects	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	12,755	6,623	5,885	5,189	4,542	3,914	5,016	4,492	3,920	3,339	2,662
R ²		0.0771	0.0624	0.0620	0.0703	0.0866	0.228	0.294	0.374	0.484	0.578

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Addition to Table IV continued

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

Panel C: Change in Net Worth / Total Assets	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent Variable	Change from t to t+1	Change from t to t+2	Change from t to t+3	Change from t to t+4	Change from t to t+5	Change from t to t+1	Change from t to t+2	Change from t to t+3	Change from t to t+4	Change from t to t+5
Regression Methodology	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Covenant Violation	-0.628 (0.405)	-1.349** (0.644)	-0.142 (0.783)	-0.795 (0.983)	-1.088 (1.241)	-0.940** (0.438)	-1.629** (0.644)	-0.517 (0.702)	-1.075 (0.833)	-1.413 (0.946)
<i>Borrower Characteristics</i>										
Profitability	3.304*** (1.078)	3.914** (1.723)	4.753** (2.214)	5.348* (2.752)	4.125 (3.289)	4.275** (1.985)	5.087** (2.524)	6.228** (3.070)	6.905** (3.224)	1.990 (3.420)
Current Ratio	0.110 (0.117)	0.194 (0.204)	0.359 (0.275)	0.518 (0.334)	0.821** (0.384)	-0.280 (0.201)	-0.464 (0.298)	-0.305 (0.312)	-0.270 (0.368)	0.116 (0.400)
Leverage	15.035*** (0.833)	27.825*** (1.475)	37.689*** (1.959)	44.714*** (2.374)	52.279*** (2.912)	39.993*** (1.542)	73.223*** (2.419)	96.764*** (2.637)	110.584*** (2.702)	122.299*** (3.162)
Coverage	-0.006* (0.004)	-0.008 (0.007)	-0.004 (0.009)	-0.009 (0.010)	-0.010 (0.011)	-0.012** (0.005)	-0.016** (0.007)	-0.009 (0.009)	-0.011 (0.010)	-0.014 (0.011)
5 year Profit Trend	-0.019 (0.045)	-0.029 (0.074)	-0.094 (0.097)	-0.188* (0.106)	-0.218* (0.119)	0.087 (0.053)	0.158** (0.077)	0.162* (0.087)	0.111 (0.083)	0.136 (0.088)
Market to Book	0.849*** (0.123)	1.129*** (0.211)	1.096*** (0.279)	1.175*** (0.333)	1.116*** (0.405)	1.664*** (0.209)	1.897*** (0.323)	1.556*** (0.384)	1.433*** (0.382)	1.515*** (0.382)
Log (Total Assets)	-0.252*** (0.084)	-0.567*** (0.150)	-0.979*** (0.205)	-1.222*** (0.257)	-1.394*** (0.314)	-0.392 (0.353)	-1.563** (0.617)	-3.080*** (0.773)	-3.643*** (0.833)	-3.861*** (0.849)
Constant	-11.476*** (1.101)	-20.738*** (1.854)	-24.301*** (2.397)	-26.991*** (2.986)	-28.790*** (3.573)	-10.282*** (2.921)	-16.269*** (4.376)	-131.956*** (3.755)	-61.597*** (2.641)	-59.726*** (3.735)
Borrower Fixed Effects	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	15,002	13,572	12,194	10,886	9,628	15,002	13,572	12,194	10,886	9,628
R ²	0.078	0.124	0.156	0.179	0.200	0.242	0.405	0.522	0.609	0.683

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Addition to Table IV continued

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

Panel D: Change in Leverage	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent Variable	Change from t to t+1	Change from t to t+2	Change from t to t+3	Change from t to t+4	Change from t to t+5	Change from t to t+1	Change from t to t+2	Change from t to t+3	Change from t to t+4	Change from t to t+5
Regression Methodology	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Covenant Violation	0.201 (0.331)	0.594 (0.531)	-0.031 (0.673)	0.371 (0.810)	0.404 (1.023)	0.490 (0.361)	0.878* (0.532)	0.412 (0.611)	0.903 (0.693)	0.860 (0.761)
<i>Borrower Characteristics</i>										
Profitability	-2.464*** (0.899)	-2.686* (1.418)	-3.438* (1.840)	-4.315* (2.339)	-3.480 (2.761)	-3.541** (1.617)	-3.532* (1.958)	-4.456** (2.254)	-5.385** (2.445)	-2.193 (2.675)
Current Ratio	-0.074 (0.104)	-0.139 (0.178)	-0.348 (0.228)	-0.578** (0.275)	-0.817** (0.318)	0.382** (0.177)	0.595** (0.260)	0.358 (0.261)	0.166 (0.294)	-0.097 (0.314)
Leverage	-0.146*** (0.007)	-0.258*** (0.012)	-0.345*** (0.016)	-0.409*** (0.020)	-0.472*** (0.023)	-0.382*** (0.013)	-0.674*** (0.020)	-0.885*** (0.021)	-1.016*** (0.021)	-1.114*** (0.023)
Coverage	0.004 (0.003)	0.006 (0.006)	0.005 (0.007)	0.010 (0.008)	0.013 (0.009)	0.010** (0.005)	0.015** (0.006)	0.012 (0.008)	0.016** (0.008)	0.021** (0.009)
5 year Profit Trend	0.000 (0.037)	0.011 (0.060)	0.066 (0.076)	0.141* (0.084)	0.148 (0.095)	-0.105** (0.044)	-0.164*** (0.062)	-0.164** (0.066)	-0.118* (0.064)	-0.140** (0.068)
Market to Book	-0.612*** (0.115)	-0.754*** (0.195)	-0.741*** (0.242)	-0.758*** (0.288)	-0.684** (0.339)	-1.209*** (0.180)	-1.287*** (0.277)	-1.075*** (0.315)	-0.998*** (0.324)	-1.094*** (0.300)
Log (Total Assets)	0.220*** (0.074)	0.467*** (0.132)	0.808*** (0.181)	1.059*** (0.226)	1.283*** (0.270)	0.096 (0.307)	0.815 (0.511)	1.762*** (0.611)	2.106*** (0.654)	2.339*** (0.657)
Constant	10.737*** (0.982)	18.995*** (1.619)	22.674*** (2.137)	24.940*** (2.637)	25.465*** (3.063)	8.967*** (2.527)	15.693*** (3.735)	88.934*** (3.173)	60.664*** (2.138)	57.649*** (2.815)
Borrower Fixed Effects	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	15,002	13,572	12,194	10,886	9,628	15,002	13,572	12,194	10,886	9,628
R ²	0.092	0.143	0.176	0.201	0.225	0.273	0.441	0.557	0.644	0.714

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Addition to Table IV continued

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Credit Risk

Panel E: Loss Making Quarters	(1)	(2)
Dependent Variable	Number of Loss Making Quarters	
Regression Methodology	OLS	OLS
Covenant Violation	0.064 (0.096)	0.101 (0.089)
<i>Borrower Characteristics</i>		
Profitability	-4.953*** (0.701)	-6.054*** (0.677)
Current Ratio	0.088** (0.042)	0.095** (0.039)
Leverage	0.001 (0.003)	-0.384 (0.345)
Coverage	-0.006*** (0.001)	-0.003*** (0.001)
5 year Profit Trend	-0.015 (0.009)	-0.011 (0.008)
Market to Book	0.138** (0.061)	-0.113** (0.051)
Log (Total Assets)	-0.000 (0.028)	0.280*** (0.077)
Constant	1.083** (0.436)	2.163*** (0.586)
Borrower Fixed Effects	NO	YES
Year Fixed Effects	YES	YES
Industry Fixed Effects	YES	YES
Rating Fixed Effects	YES	YES
Number of Observations	16,150	16,150
R ²	0.165	0.483

Addition to Table VI

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Change in CEO

The table reports descriptive statistics of changes in CEO data (Panel A) as well as results from multivariate regressions of different dependent variables. These are the All-in-Spread-Drawn (Panel B), the number of financial covenants (Panel C), the average distance to covenant violation (DCV) (Panel D) and the DCV (Panel E). Results for the contract intensity are not reported due to insufficient observations. Prior covenant violation is a dummy variable equal to one if the borrower violated a financial covenant in the prior loan contract. The change in CEO data is derived from ExecuComp and amended with the reason why the CEO left the firm from Eisfeldt and Kuhnen (2013) available at Andrea L. Eisfeldt's personal website for the period 1992 to 2006. Panel A shows the number and percentage of changes in CEO by the reason why the CEO left the firm using only the classifications from ExecuComp over 1996 to 2010 in column (1), using only the classifications from Eisfeldt and Kuhnen (2013) over 1996 to 2006 in column (2), and using the classifications from Eisfeldt and Kuhnen (2013) over 1996 to 2006 and the classifications from ExecuComp from 2007 to 2010 in column (3). All regressions include the control variables from Table III described in Appendix 1. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A	(1)	(2)	(3)
Data Source	Only ExecuComp	Only Eisfeldt and Kuhnen (2013)	Eisfeldt and Kuhnen (2013) and ExecuComp
Resigned / Forced Turnover	99 18.929%	61 15.762%	93 17.782%
Retired	179 34.226%	111 28.682%	157 30.019%
Unknown /Unclassified Turnover	245 46.845%	215 55.556%	273 52.199%
Total Number of CEO Changes	523	387	523

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Addition to Table VI

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Managerial Agency Problems

Panel B: AISD	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Data Source	Only ExecuComp			Only ExecuComp		Eisfeldt and Kuhnen (2013) and ExecuComp	
Regression Methodology	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Prior Covenant Violation	13.926*** (4.381)	13.894*** (4.363)	17.142*** (5.134)	13.911*** (4.352)	17.325*** (5.142)	13.945*** (4.336)	17.199*** (5.139)
Change in CEO		-0.729 (4.536)	5.261 (5.543)				
Prior Covenant Violation *			-12.253 (8.566)				
Change in CEO				12.142 (10.558)	20.933 (13.917)	16.192* (8.724)	30.450** (12.210)
Change in CEO - Resigned				-3.031 (6.137)	2.421 (7.365)	-1.060 (7.315)	1.599 (8.563)
Change in CEO - Retired				-4.404 (5.899)	1.489 (7.395)	-6.065 (5.827)	-1.042 (6.885)
Change in CEO - Unknown					-16.605 (18.389)		-28.662 (19.025)
Prior Covenant Violation *					-13.052 (12.469)		-5.805 (15.344)
Change in CEO - Resigned					-11.159 (11.516)		-9.709 (10.252)
Prior Covenant Violation *							
Change in CEO - Retired							
Prior Covenant Violation *							
Change in CEO - Unknown							
Control Variables	YES	YES	YES	YES	YES	YES	YES
Number of Observations	1,948	1,948	1,948	1,948	1,948	1,948	1,948
R ²	0.709	0.709	0.709	0.710	0.710	0.710	0.711

Panel C: Covenant Number	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Data Source	Only ExecuComp			Only ExecuComp		Eisfeldt and Kuhnen (2013) and ExecuComp	
Regression Methodology	Ordered Logit	Ordered Logit	Ordered Logit	Ordered Logit	Ordered Logit	Ordered Logit	Ordered Logit
Prior Covenant Violation	0.371*** (0.126)	0.370*** (0.126)	0.390*** (0.149)	0.365*** (0.126)	0.388*** (0.149)	0.366*** (0.127)	0.386*** (0.150)
Change in CEO		-0.042 (0.129)	-0.003 (0.167)				
Prior Covenant Violation *			-0.080 (0.280)				
Change in CEO				-0.340 (0.291)	-0.125 (0.338)	-0.341 (0.312)	-0.185 (0.351)
Change in CEO - Resigned				0.004 (0.203)	-0.166 (0.280)	0.190 (0.212)	0.384 (0.270)
Change in CEO - Retired				0.051 (0.170)	0.198 (0.224)	-0.071 (0.168)	-0.165 (0.231)
Change in CEO - Unknown					-0.411 (0.566)		-0.330 (0.639)
Prior Covenant Violation *					0.387 (0.414)		-0.415 (0.454)
Change in CEO - Resigned					-0.271 (0.350)		0.176 (0.339)
Prior Covenant Violation *							
Change in CEO - Retired							
Prior Covenant Violation *							
Change in CEO - Unknown							
Control Variables	YES	YES	YES	YES	YES	YES	YES
Number of Observations	1,904	1,904	1,904	1,904	1,904	1,904	1,904
R ²	0.188	0.188	0.188	0.189	0.189	0.189	0.189

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Addition to Table VI continued

Dynamic Loan Contracting Following Covenant Violations in the Prior Loan – Alternative Explanations – Managerial Agency Problems

Panel D: Average DCV	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Data Source	Only ExecuComp			Only ExecuComp		Eisfeldt and Kuhnen (2013) and ExecuComp	
Regression Methodology	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Prior Covenant Violation	-1.525*** (0.426)	-1.527*** (0.425)	-1.377*** (0.481)	-1.579*** (0.429)	-1.396*** (0.484)	-1.545*** (0.423)	-1.346*** (0.486)
Change in CEO		0.670 (0.414)	0.975 (0.663)				
Prior Covenant Violation *			-0.645 (0.844)				
Change in CEO							
Change in CEO - Resigned				-1.064 (0.651)	-0.528 (0.848)	-0.232 (0.983)	1.329 (1.546)
Change in CEO - Retired				0.718 (0.667)	0.115 (0.904)	1.049 (0.647)	0.424 (0.811)
Change in CEO - Unknown				1.346** (0.635)	2.383** (1.160)	0.737 (0.576)	1.144 (1.006)
Prior Covenant Violation *					-1.179 (1.358)		-3.558* (2.100)
Change in CEO - Resigned					1.353 (1.411)		1.292 (1.349)
Prior Covenant Violation *					-2.031 (1.323)		-0.827 (1.179)
Change in CEO - Unknown							
Control Variables	YES	YES	YES	YES	YES	YES	YES
Number of Observations	1,612	1,612	1,612	1,612	1,612	1,612	1,612
R ²	0.231	0.233	0.234	0.238	0.241	0.234	0.238

Panel E: DCV	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Data Source	Only ExecuComp			Only ExecuComp		Eisfeldt and Kuhnen (2013) and ExecuComp	
Regression Methodology	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Prior Covenant Violation	-1.272*** (0.275)	-1.273*** (0.275)	-1.230*** (0.328)	-1.307*** (0.277)	-1.245*** (0.330)	-1.279*** (0.276)	-1.202*** (0.331)
Change in CEO		0.157 (0.334)	0.244 (0.571)				
Prior Covenant Violation *			-0.185 (0.651)				
Change in CEO							
Change in CEO - Resigned				-0.966** (0.464)	-0.759 (0.646)	-0.665 (0.749)	0.250 (1.220)
Change in CEO - Retired				0.056 (0.401)	-0.145 (0.581)	0.013 (0.413)	-0.515 (0.657)
Change in CEO - Unknown				0.698 (0.549)	1.032 (1.101)	0.490 (0.461)	0.657 (0.850)
Prior Covenant Violation *					-0.454 (0.863)		-2.085 (1.416)
Change in CEO - Resigned					0.451 (0.776)		1.094 (0.875)
Prior Covenant Violation *					-0.655 (1.216)		-0.332 (0.940)
Change in CEO - Unknown							
Control Variables	YES	YES	YES	YES	YES	YES	YES
Number of Observations	1,612	1,612	1,612	1,612	1,612	1,612	1,612
R ²	0.182	0.182	0.182	0.185	0.185	0.183	0.185

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Addition to Table IX

Profitability-Based versus Capital-Based Covenants and Dynamic Loan Contracting

The table reports results from the analysis of various covenant types. These are categorized into profitability-based and capital-based covenants following partly Christensen and Nikolaev (2012). Profitability Covenants are Debt to EBITDA, Debt Service Coverage Ratio, EBITDA, Fixed Charge Coverage Ratio, Interest Coverage Ratio, Senior Debt to EBITDA. Capital Covenants are Asset Coverage Ratio, Current Ratio, Debt to Capitalization, Debt to Net Worth, Net Worth, Quick Ratio, Senior Debt to Capitalization, Senior Debt to Net Worth, Tangible Net Worth, Working Capital. Violation Profitability Covenant indicates violations of EBITDA, Debt to EBITDA, Debt Service Coverage Ratio, Fixed Charge Coverage Ratio, Interest Coverage Ratio or Senior Debt to EBITDA covenants in the prior loan; Violation Leverage Covenant is defined accordingly and includes Debt to Capitalization and Senior Debt to Capitalization covenants; Violation Net Worth Covenant includes Debt to Net Worth, Net Worth, Senior Debt to Net Worth and Tangible Net Worth covenants; Violation Short-term Covenant includes Asset Coverage Ratio, Current Ratio, Quick Ratio, Working Capital, Cash and Cash Equivalents covenants. Note that Cash and Cash Equivalents are neither classified as profitability nor as capital covenants in Christensen and Nikolaev (2012), but are included in our classification of Short-term Covenants. Panel A shows the percentage of contracts including a (1) Profitability covenant, (2) Capital Covenant, (3) Leverage Covenant, (4) Net Worth Covenant and (5) Short-term Covenant given that the covenant type mentioned in the first column was violated in the prior loan. Panel B reports the results from regressions relating in models (1) to (4) and (7) to (12) an indicator variable which is one when a profitability covenant, capital covenant, leverage covenant, net worth covenant or short term covenant is included in the new loan to the type of prior covenant violation. The percentage of profitability-based covenants is calculated as profitability-based covenants over profitability-based plus capital-based covenants. All variables are described in Appendix 1. In Panels B and C, Model (5) “Secured” is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A: Percentage of Contracts Including a Covenant Type conditional on having violated a Specific Covenant Type in the Prior Contract					
	(1)	(2)	(3)	(4)	(5)
	Profitability Covenant	Capital Covenant	Leverage Covenant	Net Worth Covenant	Short-term Covenant
<i>Prior Covenant Violation</i>					
Violation Profitability Covenant	96.49%	40.62%	7.58%	29.57%	48.31%
Violation Capital Covenant	89.86%	68.28%	23.46%	40.90%	48.15%
Violation Leverage Covenant	80.39%	71.08%	55.14%	26.17%	46.26%
Violation Net Worth Covenant	92.39%	63.04%	13.28%	53.39%	39.84%
Violation Short-term Covenant	91.56%	77.92%	16.56%	31.29%	65.64%

NOT FOR PUBLICATION

Addition to Table IX continued

Profitability-Based versus Capital-Based Covenants and Dynamic Loan Contracting

Panel B: Including Profitability or Capital Covenants in the Subsequent Contract												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Profitability Covenant	Profitability Covenant	Capital Covenant	Capital Covenant	Percentage of Profitability Covenants	Percentage of Profitability Covenants	Leverage Covenant	Leverage Covenant	Net Worth Covenant	Net Worth Covenant	Short- term Covenant	Short- term Covenant
Regression Methodology	Logit	Logit	Logit	Logit	OLS	OLS	Logit	Logit	Logit	Logit	Logit	Logit
Violation Profitability Covenant	1.194*** (0.272)	1.237*** (0.275)	-0.638*** (0.149)	-0.612*** (0.149)	0.107*** (0.018)	0.107*** (0.018)	-1.228*** (0.217)	-1.298*** (0.234)	-0.100 (0.155)	-0.211 (0.162)	-0.249* (0.138)	-0.215 (0.141)
Violation Capital Covenant	-0.203 (0.280)		1.170*** (0.175)		-0.084*** (0.019)		1.230*** (0.216)		0.354* (0.192)		-0.128 (0.155)	
Violation Leverage Covenant		-0.244 (0.389)		1.081*** (0.332)		-0.082** (0.036)		2.728*** (0.313)		-0.413 (0.396)		-0.405 (0.258)
Violation Net Worth Covenant		-0.510 (0.342)		0.890*** (0.204)		-0.070*** (0.022)		0.259 (0.277)		1.102*** (0.230)		-0.412** (0.194)
Violation Short-term Covenant		-0.047 (0.501)		0.795* (0.412)		-0.072** (0.035)		0.422 (0.410)		-0.726** (0.333)		0.938*** (0.317)
Loan Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	2497	2497	2497	2497	2693	2693	2,563	2,563	2,680	2,680	2,706	2,706
R ²	0.365	0.367	0.236	0.232	0.343	0.344	0.293	0.332	0.183	0.203	0.112	0.121

Addition to Table XI

The Dynamic Effect of Past Covenant Violations on Loan Contract Terms

The table reports results from multivariate regressions of various price and non-price loan contract terms on covenant violations and control variables. These are the (1) All-in-Spread-Drawn, (2) the number of financial covenants, (3) the average distance to covenant violation (DCV), (4) the DCV, and (5) the contract intensity as well as in Panel B the percentage of profitability covenants. The regressions segregate the sample into different time periods reflecting the sequence of loans of individual borrowers. Second (Third) Loan is an indicator variable for the second (third) loan, the first loan is the base case. “Second Loan, Violation in First Loan” (Third Loan, Violation in Second Loan) is an indicator variable equal to 1 if the borrower has violated a covenant in the first (second) loan and obtains the second (third) loan. In Panel A these indicator variables are replaced by the number of covenants violated in the second (third) loan contract. In Panel B, these indicator variables are also replaced by the type of covenant violated in the second (third) loan contract. All variables are described in Appendix 1. In Models (5) and (10) “Secured” is excluded as it is part of the dependent variable. Standard errors shown in parentheses are robust to heteroscedasticity and clustered at the firm level. The statistical significance of results is indicated by * = 10% level, ** = 5% level and *** = 1% level.

Panel A	(1)	(2)	(3)	(4)	(5)
Dependent Variable	AISD	Covenant Number	Average DCV	DCV	Contract Intensity
Regression Methodology	OLS	Ordered Logit	OLS	OLS	Ordered Logit
Second Loan	-7.877* (4.114)	-0.233** (0.115)	1.734*** (0.448)	0.966*** (0.376)	0.065 (0.263)
Second Loan, Violation in First Loan					
1 Covenant Violated	2.232 (5.639)	0.213 (0.173)	-1.872*** (0.495)	-1.046*** (0.443)	0.158 (0.360)
2 Covenants Violated	18.262** (8.405)	-0.011 (0.188)	-1.373** (0.638)	-1.128*** (0.361)	0.154 (0.378)
3 Covenants Violated	35.055*** (10.186)	0.630** (0.247)	-2.180*** (0.510)	-1.149*** (0.382)	0.493 (0.443)
4 or more Covenants Violated	39.927*** (12.286)	1.604*** (0.323)	-2.239*** (0.543)	-1.327*** (0.429)	-0.442 (0.613)
Third Loan	-10.066* (5.663)	-0.199 (0.134)	2.328*** (0.638)	1.598*** (0.503)	-0.059 (0.345)
Third Loan, Violation in Second Loan					
1 Covenant Violated	-9.868 (6.856)	0.208 (0.195)	-2.081*** (0.731)	-1.792*** (0.542)	0.347 (0.524)
2 Covenants Violated	18.153* (9.601)	0.340 (0.258)	-2.637*** (0.708)	-1.734*** (0.476)	0.167 (0.456)
3 Covenants Violated	24.494** (11.174)	0.352 (0.335)	-2.536*** (0.689)	-1.333** (0.531)	0.164 (0.503)
4 or more Covenants Violated	60.414** (25.128)	1.281*** (0.446)	-2.852*** (0.785)	-2.016*** (0.512)	0.711 (0.784)
Loan Characteristics	YES	YES	YES	YES	YES
Borrower Characteristics	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Rating Fixed Effects	YES	YES	YES	YES	YES
Loan Type Fixed Effects	YES	YES	YES	YES	YES
Loan Purpose Fixed Effects	YES	YES	YES	YES	YES
Number of Observations	4145	4074	3472	3472	1684
R ²	0.632	0.137	0.186	0.121	0.195

NOT FOR PUBLICATION

Addition to Table XI continued

The Dynamic Effect of Past Covenant Violations on Loan Contract Terms

Panel B		(1)	(2)	(3)
Dependent Variable		Percentage of Profitability Covenants	Percentage of Profitability Covenants	Percentage of Profitability Covenants
Regression Methodology		OLS	OLS	OLS
Second Loan		-0.003 (0.017)	-0.009 (0.017)	-0.009 (0.016)
Second Loan, Violation in First Loan		0.025 (0.020)		
(1)	Second Loan, Violation Profitability Covenant in First Loan		0.079*** (0.020)	0.077*** (0.020)
(2)	Second Loan, Violation Capital Covenant in First Loan		-0.075*** (0.023)	
(3)	Second Loan, Violation Leverage Covenant in First Loan			-0.070* (0.038)
(4)	Second Loan, Violation Net Worth Covenant in First Loan			-0.045* (0.026)
(5)	Second Loan, Violation Short-term Covenant in First Loan			-0.098** (0.050)
Third Loan		-0.021 (0.025)	-0.036 (0.024)	-0.037 (0.024)
Third Loan, Violation in Second Loan		0.048* (0.026)		
(6)	Third Loan, Violation Profitability Covenant in Second Loan		0.133*** (0.025)	0.130*** (0.025)
(7)	Third Loan, Violation Capital Covenant in Second Loan		-0.095*** (0.028)	
(8)	Third Loan, Violation Leverage Covenant in Second Loan			-0.134** (0.060)
(9)	Third Loan, Violation Net Worth Covenant in Second Loan			-0.057* (0.031)
(10)	Third Loan, Violation Short-term Covenant in Second Loan			-0.039 (0.051)
Loan Characteristics		YES	YES	YES
Borrower Characteristics		YES	YES	YES
Year Fixed Effects		YES	YES	YES
Industry Fixed Effects		YES	YES	YES
Rating Fixed Effects		YES	YES	YES
Loan Type Fixed Effects		YES	YES	YES
Loan Purpose Fixed Effects		YES	YES	YES
Wald Test for (1)+(2)=0 ; (6)+(7)=0			0.886; 0.284	
Wald Test for (1)+(3)=0 ; (1)+(4)=0; (1)+(5)=0				0.877; 0.263; 0.672
Wald Test for (6)+(8)=0 ; (6)+(9)=0; (6)+(10)=0				0.952; 0.047; 0.109
Number of Observations		4047	4047	4047
R ²		0.300	0.312	0.312