THE PUZZLE OF NEW LOAN ISSUANCE

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ABSTRACT

This study documents that firms show an economically material deterioration in financial performance after receiving new loans with medium- to long-term maturity. Banks do not seem to anticipate the performance deterioration. At loan initiation, contract terms for creditor protection are not significantly different between firms that show adverse changes in profitability afterward and those that do not. After loan origination, firms experiencing a decline in profitability renegotiate loan contracts more frequently and face higher interest spreads when negotiating the next contract, even if they had not violated any covenants or switched to a different lender. The results cannot be explained by the interests increases. Overall, the evidence suggests that initial financial contracting have limitations in preventing firms from engaging in activities that lead to unfavorable changes to credit risk.

1. INTRODUCTION

Banks are conventionally considered to be more informed participants in the debt market, because they have built up large databases on loan defaults and recovery rates and have access to each borrower's private information. However, when a firm applies for a new loan (i.e., submits a proposal for a new project instead of revising or renewing existing credit agreements), critical information about the firm's future creditworthiness is often unverifiable at that time. Theoretically, banks can mitigate the problems due to information asymmetry in conjunction with agency conflicts through financial contracts. In practice, initial contracts are frequently renegotiated after loan originations, and these renegotiations often lead to a relaxation of credit terms. Hence, a natural question arises about how effectively banks can screen borrowers who apply for new loans, if information acquisition takes time and borrowers expect to renegotiate the initial contracts *ex post*.

Prior literature has proposed that banks play a special role as delegated monitors in the financial market (e.g., Diamond 1984), because they (1) develop expertise in analyzing large industry and firm level datasets (e.g., Ramakrishnan and Thakor 1984), (2) have access to borrowers' private information, and (3) can design customized loan contracts to restrict borrowers' behavior and monitor their performance after loan origination (e.g., Jensen and Meckling 1976; Gale and Hellwig 1985; Hart 1995). Earlier empirical studies showed that receiving bank loans leads to a positive equity market reaction (e.g., James 1987; Mikkelson and Partch 1986).

However, theories and empirical evidence from recent studies on banking industry and contracting identify several issues that could potentially compromise the effectiveness of banks' screening of borrowers. First, information acquisition takes time (e.g., Liberti and Peterson 2017), even when a borrower has a prior lending relationship with the lender. A prior lending relationship may reduce borrower-specific information asymmetry, but not necessarily project-specific information asymmetry. For example, when a firm applies for a new loan, banks may know a CEO's personal traits and political connections but cannot fully verify managerial estimated future cash flows of investment projects until they observe the firm's realized performance following loan origination.

Second, initial contracting has limitations for mitigating information asymmetry in conjunction with agency conflicts, because *ex post* renegotiations are frequent and often lead to a relaxation of credit terms (e.g., Denis and Wang 2014; Roberts 2015). Contracts are renegotiable, because addressing all the contingencies *ex ante* is impossible (e.g., Aghion and Bolton 1992; Hart 1988; Gârleanu and Zwiebel 2009). However, borrowers' expectations about being able to renegotiate *ex post* without sufficiently high costs could change borrowers' *ex ante* incentives. Banks may not be able to fully differentiate between borrowers or effectively mitigate adverse selection and moral hazard through initial financial contracts.

Third, banks may not necessarily enforce strict screening standards if they can share the risk with other investors or if they are too optimistic about the risks of new lending opportunities (e.g., Fahlenbrach, Prilmeier, and Stulz 2017). Some recent studies find that the equity market responds positively to loan announcements only when the announcements indicate that the bank intends to keep the originated loan (Dahiya, Puri, and Sanders 2003) or when the announcements are about renegotiated loans (e.g., Nikolaev 2016). The positive market reactions documented in earlier studies are likely driven by a small sample of firms that self-select into announcing the information about loan financing (e.g., Lummer and McConnell 1989; Maskara and Mullineaux 2011).

Hence, it is an empirical question of whether banks are effective in screening borrowers for new loan applications. I explore this question by examining the pattern in the financial performance of borrowers around loan originations and how it is related to loan contracting. Financial performance reflects managers' operating and investment decisions and determines a borrower's creditworthiness. Banks are particularly concerned with the adverse changes in borrowers' financial performance, because such changes reduce the expected value of debt (e.g., Merton 1974).

I start with a sample of new loans for nonregulated public firms with a maturity of at least 3 years originating in the 1996−2012 period. Following Nikolaev (2016), I separate the loan packages recorded for new loans based on SEC filings on material contracts from restated loans recorded in DealScan database. Pertinent information about the credit terms in the initial contracts is gathered. Moreover, for the additional analyses on the interactions between borrowers and banks, I also collect information about renegotiations following loan origination and interest spreads of next loans. I focus on loans of medium- to long-term duration, because short-term loans tend to be relatively small in size and are expected to be repaid fairly soon. These loans are less likely to be subject to adverse selection and moral hazard.

My findings are threefold. First, contrary to the common perception that borrowers passing banks' screening are better-quality firms, I find that these firms actually experience significant deterioration in profitability (measured before expenses on depreciation, interests, and taxes) after loan originations. Additional results from difference-in-differences tests further confirm that the profitability of financing firms and control firms during the prefinancing period is not statistically significantly different. However, after loan originations, the profitability of financing firms declines and is significantly lower than that of matched control firms.

Second, evidence from tests of initial contract terms and subsequent renegotiations suggests that the deteriorating performance of financing firms is unexpected and economically material. If a borrower had revealed adverse changes in performance when applying for loans, that information should be incorporated into the contract terms and would not increase the likelihood of renegotiations. However, I do not find that a decline in future profitability is significantly associated with any of the following contract terms for creditor protection (i.e., interest spreads, performance pricing provisions, collateral requirement, total number of covenants, and/or syndication status). Moreover, a borrower's performance deterioration is significantly associated with the frequency of renegotiations after loan originations. Note that a decline in profitability does not necessarily trigger renegotiations if the decline was anticipated or did not lead to borrowers' defaults. Usually, borrowers have incentives to initiate renegotiations for more favorable credit terms when their financial performance improves, but they are unlikely to do so when their financial performance deteriorates. Lenders also cannot arbitrarily initiate renegotiations unless borrowers violate or approach violating certain terms. Hence, an increase in renegotiation frequency suggests that the decline in borrowers' profitability after loan originations is economically material and unexpected.

Finally, I find that borrowers with adverse changes in performance after loan origination tend to face higher interest spreads when they negotiate the next loan contract, even if they have not violated any covenants and switch to a different lender. This evidence suggests that, in addition to concurrent measures of firm creditworthiness, the dynamics of firms' prior performance also play a role in loan contracting.

My results are robust to alternative profitability measures and different control samples. The results on borrowers' post-loan origination performance remain similar when I remove loans originating during the recent financial crisis. Notably, additional analysis further shows that borrowers only experience significant deterioration in financial performance for loan originations, but not for loan restatements. The degree of project-specific information asymmetry is expected to be significantly reduce at the time of loan restatement, because banks and borrowers have already engaged in a series of renegotiations. Frequent interactions also improve risk sharing and monitoring efficiency (Boot and Thakor 1994). Hence, financial performance does not significantly change around loan restatements.

This study contributes to the literature on banks' effectiveness in screening borrowers by documenting a surprising pattern in changes in financial performance after borrowers receive new loans. Prior literature suggests that banks have a competitive advantage in evaluating and screening borrowers. However, because the acquisition of project-specific information takes time, and initial contracts are often renegotiated, I reinvestigate the interactions between banks and borrowers by separating new loans from renegotiated loans. Contrary to common belief, the results show that banks' initial screening is limited in differentiating between types of borrowers. Notably, the results do not imply that banks are ineffective in rejecting all poor-quality borrowers. The evidence merely suggests that, for borrowers who have passed the screening for new loan applications, changes in their post-financing performance are, on average, still unfavorable to banks.

The empirical evidence in this paper also lends support to the dynamic contracting theory (e.g., Garleanu and Zwiebel 2009; Gorton and Kahn 2000). When information asymmetry is high and both parties expect to renegotiate contract terms in the future, credit terms in initial loan contracts are limited in preventing borrowers from engaging in activities that are undesirable to banks. The information on how firm performance varies around the previous loan origination appears to also affect the negotiation of future loan contracts, even if the adverse changes have not lead to covenant violations or if the borrower switches to a different lender.

The remainder of this paper is organized as follows. In Section 2, I discuss the related literature and develop empirical predictions. Section 3 introduces the sample selection process and research design. Finally, Section 4 presents the empirical results, and Section 5 presents the conclusions.

2. THEORETICAL MOTIVATION AND EMPIRICAL PREDICTIONS

2.1. Dynamics of the Private Lending Process

Bank loans represent a common avenue for firms to finance their business. To receive loan financing, borrowers must provide financial information about their past performance, the purpose of financing, projected future performance, collateral information, etc.[1] If a borrower's creditworthiness meets a bank's internal screening standards, both parties will negotiate and draft a customized loan contract (i.e., the original contract). The initiation of a new loan reflects that a borrower seeks new external financing to fund its operation or its investment plans. Borrowers may receive a new loan from banks with or without a prior lending relationship.

After loan initiation, both parties must comply with the terms in the loan contract. However, these terms can be renegotiated following the arrival of new information. Most renegotiations are primarily

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[1]Aileron, "7 Steps To Getting A Business Loan," Forbes.com, October 2, 2014.

initiated by borrowers as their condition changes (see Roberts 2015). Banks normally do not initiate renegotiations unless contractual breaches, such as covenant violations or payment defaults, occur (e.g., Chava and Roberts 2008; Roberts and Sufi 2009). If the amendments to contract terms are minor, they will be incorporated into the original contract. When renegotiations lead to multiple amendments or significant changes to an original contract, a new stand-alone amended and restated agreement, which includes all previous amendments, will replace the original contract.[2] When renegotiations on loan contracts occur, borrowers will file the documents as Exhibit 10 ("Material contracts") to Form 8-K, 10-K, or 10-Q. The amendments or restatements of loan contracts do not imply that a borrower has applied for another loan.

2.2. Banks' Information Advantages and Credit Control

Prior literature on financial intermediation suggests that banks have an information advantage over public investors and can act as delegated monitors. Compared with other participants in the debt market, banks are more informed institutions for three reasons. First, banks invest in technology that allows them to gather and analyze large datasets on the macro-economy and on various industries. Yielded findings allow them to better assess corporate default risk.

Second, banks have access to a company's private information, such as managerial estimates of future performance of investment projects or details about merger and acquisition deals. Such information helps banks better evaluate borrowers' future creditworthiness. Hence, banks have a unique role in screening borrowers, because their lending decisions are based on a more comprehensive information set compared with that of other market participants (e.g., Benston and Smith 1976; Diamond 1984; Ramakrishnan, and Thakor 1984).

Third, banks could mitigate agency conflicts due to information asymmetry through customized loan contracts. For example, banks can require collateral in case borrowers cannot generate sufficient cash flows to repay their debts. Banks may also include financial and negative covenants to monitor borrowers' financial health and restrict excessive risk-taking behavior. Financial covenants will transfer control rights to banks if firms fail to meet the expected financial performance (e.g., Bolton and Dewatripont 2005; Chava and Roberts 2008). Negative covenants restrict borrowers' activities that could potentially hurt lenders' interests, such as overinvestment or excessive dividend payouts (e.g., Chava, Kumar, and Warga 2010; Jensen and Meckling 1976). Some covenant restrictions, such as an excess cash sweep that requires firms to repay banks first with excess cash at hand and thereby reduce the free cash-flow problem, may also alleviate the agency conflicts between shareholders and managers.

In addition, loan contracts can be designed to differentiate between borrowers with different prospects. Prior studies suggest that borrowers may reveal private information about future creditworthiness to lenders by agreeing on certain contract terms during loan negotiations (e.g., Chan and Kanats 1985; Rajan and Winton 1995). For example, borrowers may accept tight covenants or covenants with tightening requirements to signal their investment opportunities (Demiroglu and James 2010; Chava, Fang, and Prabhat 2017). Banks may also include performance pricing provisions, which will automatically adjust interest spreads based on borrowers' financial performance (e.g., Asquith, Beatty, and Weber 2005). The inclusion of this provision may reduce a borrower's incentives to apply for loans if the borrower expects its creditworthiness to deteriorate (Manso, Strulovici, and Tchistyi 2010).

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[2] Roberts (2015) provides a detailed description of the different types of renegotiations.

Hence, prior literature suggests that financial contracting can mitigate the problems resulted from moral hazard and adverse selection (Chava, Kumar and Warga 2010; Hart 1995).

In sum, the stream of literature on the uniqueness of banks suggests that banks have access to a larger set of information over public investors and maintain control over borrowers through customized loan contracts.

2.3. Limitations in Information Acquisition and Contracting

Although it is commonly accepted that banks have an information advantage, evidence from recent studies raises several issues that could potentially compromise banks' effectiveness in screening borrowers. First, the acquisition and verification of information take time (see Liberti and Peterson 2017), even when a borrower has a prior lending relationship with the bank. Critical information related to a borrower's future creditworthiness, such as corporate culture and expected cash flows of investment projects, is unverifiable—and sometimes ignored—when a borrower applies for a new loan. Such information can be observed and verified only gradually after loan originations. Verifiable information, such as audited financial statements, usually is not timely and has limited predictive power for future value and risk. However, such information is given a greater weight in the loan application review process because of its verifiability (Agarwal and Ben-David 2018; Minnis and Sutherland 2016).

Notably, when firms have previously borrowed from the same bank, the degree of information asymmetry still could be relatively high when these firms apply for new loans for different financing purposes. A prior lending relationship with a bank reduces borrower-specific information asymmetry, such as management style and board characteristics. However, it does not necessarily reduce project-specific information asymmetry. For example, if a bank has granted loans to a firm for working capital financing, the bank still faces high project-specific information asymmetry when the firm applies for a new loan to complete an acquisition deal.

Second, the renegotiability of loan contracts could also make banks' initial screening less effective. Loan contracts are inherently incomplete and are often renegotiated after loan originations (e.g., Aghion and Bolton 1992; Dessein 2005; Garleanu and Zwiebel 2009; Hart and Moore 1988). Although banks could include covenants to monitor borrowers' financial performance, recent empirical studies show that renegotiations often lead to a relaxation of covenant requirements (e.g., Chava, Wang, and Zou 2015; Denis and Wang 2014; Roberts 2015). Banks would relax covenant restrictions *ex post* for at least two reasons: (1) it is often not sequentially optimal to terminate projects before knowing a borrower's type due to banks' sunk costs (Bolton and Dewatripont 2005),[3] and (2) banks may prefer not to intervene in firm business when they are the uninformed party (Dessein 2005), because information asymmetry between lenders and borrowers could lead to inefficient early termination of good projects (e.g., Von Thadden 1995). Hence, expectations about *ex post* renegotiations could affect *ex ante* incentives of borrowers, who may not fully reveal their private information to lenders (Gale and Hellwig 1985, 1989).

Third, banks may not necessarily enforce strict screening standards if borrowers' default risk can be shared with other investors. Because of the development of structured finance products and active secondary loan trading market (e.g., Drucker and Puri 2009; Parlour and Plantin 2008), banks may sell the loans issued to borrowers with higher default risk in the secondary market. For example, Dahiya,

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[3] When banks are unsure of a borrower's type, they may delay terminating projects if the expected payoffs are greater than the sunk costs.

Puri, and Saunders (2003) document a negative announcement effect when a bank sells a borrower's loan.[4] In addition, banks may not effectively screen borrowers when they are too optimistic about the risks of new lending opportunities (Fahlenbrach, Prilmeier, and Stulz 2017), even if they do not intend to resell the loans.

The mixed evidence on the equity markets' reactions to loan announcements also sheds some light on the ambiguity about banks' role in screening borrowers. Earlier studies document that loan announcements, on average, have yielded positive excess stock returns (e.g., Billett, Flannery, and Garfinkel 1995; James 1987; Mikkelson and Partch 1986).[5] Other studies have shown that the market primarily positively reacts to announcements of renegotiated loans (e.g., Lummer and McConnell 1989; Nikolaev 2006). Maskara and Mullineaux (2011) argue that the documented positive market reactions to loan announcements are driven by a small sample of firms that self-select into announcing the news of loan financing. They find that the market's reaction is insignificantly different from 0 for announcements from a large sample of loans that better represents the loan population.

In summary, limitations in the information acquisition process and the incompleteness of the initial loan contracts may reduce the effectiveness of banks' screening of borrowers for new loan applications. The problems are not likely to be fully mitigated by lending relationship. A prior lending relationship reduces borrower-specific information asymmetry (e.g., Bharath et al. 2009; Boot 2000; Diamond 1991). However, the project-specific information asymmetry still could be relatively high when borrowers apply for new loans. A borrower may not reveal all the adverse information in order to obtain the loan with favorable terms, especially when renegotiations after loan originations are fairly common.

2.4. Empirical Predictions

To explore the question of whether banks are effective in screening borrowers for new loan applications, I focus on borrowers' financial performance around loan originations. Financial performance reflects the profitability of a firm's investment projects and determines a firm's ability to repay their loans. Changes in financial performance around financing events are commonly used to investigate managers' incentives. For example, prior studies suggest that firms seeking equity finance underperform relative to other nonissuing firms, because managers in the former case have taken advantage of overvalued stock prices or have intentionally inflated stock prices through earnings management prior to seeking financing (e.g., Cohen and Zarowin 2010; Loughran and Ritter 1995, 1997).

However, the empirical prediction of how a borrower's financial performance could change after loan originations is ambiguous. Statistically speaking, on one hand, borrowers who received new loans should not systematically exhibit an undesirable pattern in post-financing performance if banks can effectively differentiate between borrower types based on the information sets available when reviewing loan applications. Banks are more likely to grant loans to financially healthy borrowers or those with decent prospects.

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[4] Gande and Saunders (2012) show a positive announcement effect for borrowers whose loans have been traded in the secondary loan market. Notably, their argument for positive market reactions is that the sale of loans alleviates a firm's financial constraints instead of signaling firm quality.

[5] Although Billett et al. (1995) document a positive market reaction to loan announcements, Billett, Flannery, and Garfinkel (2006) show that these firms experience worse stock performance compared with peer firms in the same portfolio when sorted by Fama-French factors.

Also, if the economic costs of renegotiations are sufficiently high, original loan contracts should also prevent borrowers from engaging in behavior that leads to performance deterioration, especially when that behavior triggers a covenant violation. For example, after a covenant violation, banks are less likely to grant a waiver and to impose stricter restrictions on investment for borrowers who have contractually agreed to improve financial performance (Chava, Fang, and Prabhat 2017). Banks may also terminate borrowers' positive net present value projects, liquidate their assets, and force out the management team (e.g., Nini, Smith, and Sufi 2009; Ozelge and Saunders 2012; Von Thadden 1995). Under the expectation of high renegotiation costs, borrowers with adverse information are less likely to apply for loans or behave opportunistically after receiving loans. In other words, changes in borrowers' financial performance around loan originations should be insignificantly different from 0, if not positive.

On the other hand, given agency conflicts between firms and debtholders, a borrower's financial performance could deteriorate after loan originations when banks cannot fully differentiate between borrower types and the expected renegotiation costs are not prohibitively high. Borrowers' performance could deteriorate post-financing for three reasons. First, borrowers' financial performance may deteriorate because managers engage in earnings management prior to loan financing to increase the likelihood of loan approval and negotiate favorable loan contract terms. Earnings management includes accruals management (e.g., Jones 1991) and real management (e.g., Roychowdhury 2006; Stubben 2010), both of which have negative effects on future performance (Teoh, Welch, and Wong 1998; Teoh, Wong, and Rao 1998; Cohen and Zarowin 2010). Second, managers holding adverse information about future profitability may intentionally apply for loans before firm performance starts to decline (aka the "market timing motive"). By doing so, firms may avoid paying a higher interest spread later if they seek loan financing after their financial performance deteriorates. Third, because downside risk is shared with creditors, managers may be more likely to keep greater slack resources to prepare for upside risk (i.e., capacity building motive), and, doing so, could result in a decline in profitability as operating costs increase. These incentives could result in an unexpected decline in firm performance after loan originations and are not necessarily mutually exclusive.

In sum, although banks have an information advantage and expertise in screening borrowers, detecting these motives at the initial screening stage is costly (if not entirely impossible). Theoretically, contract terms may reduce adverse selection and borrowers' opportunistic incentives, because these terms transfer control rights to banks when borrowers are in bad states. However, if borrowers do not expect high renegotiation costs or severe consequences for breaching contracts, initial contract terms will be less effective in differentiating between borrower types and preventing borrowers from engaging in activities that lead to deterioration in financial performance after loan originations.

Hence, it is an empirical question of whether borrowers will exhibit a predictable pattern in financial performance after receiving new loans. The answer to that question should shed some light on the borrower-lender dynamic at the beginning of the lending process.

3. SAMPLE AND SUMMARY STATISTICS

3.1 Main Sample

I start with loan packages recorded in the DealScan database between 1996 and 2012.[6] Loan packages

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[6] Firms have been required to electronically file through EDGAR since 1996, and loan contract information has become more complete since then.

with unique identifiers in the database include newly initiated, amended and restated credit agreements (see Roberts 2015). Contracts for loan originations usually contain phrases such as "credit agreement" and "loan agreement" in the header of the filing. Amended and restated contracts, including rollovers, usually include "credit agreement amended and restated as of XXX (date)" in the header. DealScan assigns new loan package IDs to amended and restated loans, as well as rollovers, if the issuing banks indicate that the amended and restated contracts can be viewed as new credit agreements because substantial changes have been made to the original loans. Following the method proposed by Nikolaev (2016), I collect SEC filings for all the credit agreements and match those with the loan package records in the DealScan database by firm identifiers and filing dates.[7] Using a text-search algorithm that parses out contract dates and key words for amendments or restatements, I separate the filings for original agreements from those for amended and restated credit agreements.

I exclude loans taken by financial firms (SIC codes 6000–6999) or firms in the utility industries (SIC codes 4000–4999) and loan packages that cannot be linked to any SEC filings. Borrowers' annual financial information and data on stock market performance are sourced from the merged Compustat/CRSP database. The sample is further restricted by including only firms whose industry information is available and whose book value of equity is nonnegative. The total number of packages for new loans is thus 7,933.

Because credit agreements are drafted for loan packages, most of the credit terms, except for the interest spread, apply to the loan package level. A loan package may include multiple facilities (e.g., a term loan and a revolver) with different interest spreads. I keep the highest interest spread of all tranches when a package includes more than one loan facility. Next, I retain the loan deals with a maturity of no less than 3 years. I focus on medium- to long-term loan originations for the following reasons. First, short-term loans tend to be relatively small in size, and borrowers will have to repay these loans fairly soon. Hence, problems associated with adverse selection and moral hazard are likely to be less severe. Second, it takes time to observe the economic impact of managers' decisions on firm performance. For example, the impact on sales from a research and development (R&D) reduction may not immediately manifest in the year in which the spending was cut, but, rather, it may manifest in the years following the decision. This restriction reduces the sample size of loan packages to 3,929.

If a firm has multiple loan originations in a year, I collect the information on credit terms related to the loan deal with the largest amount. This restriction is imposed because a loan with the largest amount in a given year is the economically most important deal to a borrower. The total number of unique firm-year original contracts is 3,037. To examine the changes in firm performance, I collect annual financial data from a period spanning 3 years before loan origination to 3 years afterward.

In addition to the sample of new loans, I also collect the "follow-up contracts" for the same set of sample firms. Because my observation period for a borrower's performance change spans from 3 years before the loan origination to 3 years after, I collect the first loan contract available within 3 years after the observation period. The "follow-up contracts" are expected to incorporate the information revealed by changes in borrowers' performance after loan origination and during the observation period. I do not include contracts if they were generated more than 3 years after the observation period, because information acquired and revealed during the observation period will weigh less in future contracting as time goes by. Figure 1 illustrates the time line of how contracts are collected. The total number of

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[7] Nikolaev (2016) verified that, in almost all cases, the deal active dates for loan packages tracked by DealScan coincide with the contract agreement dates. Similar to his approach, when merging the two data sources, I require the contract dates be equal to deal active dates plus or minus 5 days.

follow-up loan agreements is 2,342. Table 1 reports the selection process.

[Insert Figure 1, Table 1]

Table 2 reports the descriptive statistics of financial variables for sample firms before and after loan originations. All financial variables, excluding dummy variables, are winsorized at the top and the bottom 1%. The main measure of profitability is operating income before interests, taxes, and depreciation, scaled by sales (EBITDA). Operating income before interests, taxes, and depreciation is the most commonly used profitability measure in financial covenants (e.g., Christen and Nikolaev 2012; Demerjian 2011). I also use the following two alternative profitability measures for magnitude comparison and robustness checks: net income, scaled by sales (NTM), and operating income before interests, taxes, and depreciation, scaled by beginning net operating assets (RNOA). I choose sales as the deflator for EBITDA and NTM instead of assets, because total assets will increase as a firm receives a new loan. Therefore, the profitability measures, scaled by total assets, will be mechanically lower after a firm receives a new loan. The means of the three profitability measures are consistently higher before loan origination compared with those after loan origination.

The means of control variables for firm value (measured by market to book ratio), operating efficiency (measured by asset turnover), financial health (measured by Altman's Z-score), and sales growth also decline after loan origination. These pieces of descriptive evidence suggest that, on average, the creditworthiness of borrowers declines after borrowers receive new loans. The changes in the mean value of the other control variables are consistent with firms' financing behavior. For example, both firm size and leverage increase after loan originations. Appendix A provides detailed variable definitions.

[Insert Table 2]

Table 3 reports descriptive evidence on loan characteristics and renegotiations. Panel A presents the basic loan information. About 75% of the sample loans are syndicated, and 30% are secured. Notably, among these new loans, 30% are between borrowers and banks that have had a prior lending relationship.[8] Panel B reports the top-five financing purposes of sample loans. The majority of contracts are vague about the financing purposes; about 50.2% of loans are claimed for general corporate purposes. The next common financing reason is merger and acquisition related, accounting for 23.4% of the sample. Panel C shows evidence on renegotiations. Out of the 3,037 sample contracts, 1,673 are renegotiated before the stated maturity date. Among these renegotiated contracts, 1,057 are from firms that have experienced a decrease in EBITDA after loan originations. For these firms, the mean and median number of days elapsed between the first renegotiation date and the loan originations date are 569 and 304, respectively. For firms that have experienced an increase in EBITDA after loan originations, the mean and median number of days elapsed between the first renegotiation date and the loan originations date are 554 and 281, respectively. Results from univariate t-tests show that the differences in the days elapsed between firms experiencing a decrease in EBITDA and those experiencing an increase are not significantly from 0.

[Insert Table 3]

3.2. Control sample

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[8] Following Bharath et al. (2009), I consider a loan to be a relationship-based loan if the firm has borrowed from the same bank within 5 years prior to the loan origination date.

Because temporal changes in performance can be driven by economy- or industry-wide shocks, I also construct a control sample of benchmark firms to examine loan financing firms' performance before and after loan originations. In selecting this sample, a propensity matching approach, comprising the following steps, is adopted:

Step 1: Estimate the propensity of a firm to obtain a new loan with a maturity of at least 3 years for each year using the following logistic model:

$$P(TakeLoan_{i,t}) = \beta_0 + \beta_1 Log(Assets_{i,t-1}) + \beta_2 MTB_{i,t-1} + \beta_3 Leverage_{i,t-1} + \beta_4 Zscore_{i,t-1}$$
$$+ \beta_5 SalesGrowth_{i,t-1} + \beta_6 Investment_{i,t-1} + \beta_7 PP\&E_{i,t-1} + \beta_8 EquityIssue_{i,t-1}$$
$$+ \beta_9 CashHolding_{i,t-1} + Industry/Year\ Dummies + \varepsilon_{i,t} \tag{1}$$

where *TakeLoan* equals 1 if a firm takes on a new loan with a maturity of at least 3 years and 0 otherwise. I control for firm size (*Assets*), growth options (measured by market-to-book, *MTB*), financial health (measured by *Leverage*, *Z-score*, and *Sales Growth*), investment expenditures (where *investment* is measured as the sum of R&D expenses, capital expenditure, acquisition expenses, and net increase in investment), and property, plant, and equipment (*PP&E*). In addition, two controls for financial constraint—net equity issuance (*EquityIssue*) and cash holding (*CashHolding*)—are also included. In prior literature, these factors have been identified as common determinants of loan financing decisions (e.g., Baker and Wurgler 2002; Frank and Goyal 2009; Shyam-Sunder and Myers 1999).[9] Appendix B reports the first-stage regression results for the propensity matching model.

Step 2: For each firm-year observation in the loan sample (i.e., treatment firm), the matched control firms must satisfy three criteria: (1) the firm is in the same size decile and from the same industry in the same year; (2) the difference in the propensity to take on loans between the treatment firm and the control firm is no greater than 0.01; and (3) the matched control firm does not take on loans with a maturity of more than 3 years within 3 years prior to the loan origination year of the treatment firm.

These restrictions are imposed to ensure that the benchmark firms have similar firm characteristics, face the same market environment faced by treatment firms, and do not take new medium- to long-term loans.[10] Based on the methodology discussions in Shipman et al. (2017), I include the variables used in the propensity matching in the main model.

4. EMPIRICAL RESULTS

4.1. Performance around Loan Originations

I first use a panel regression to examine the time-series changes in performance before and after loan originations for firms receiving new loans. As a robustness check, I then conduct a difference-in-differences test to examine changes in performance for the propensity-matched sample. The financial data pertain to the time period ranging from 3 years preceding the financing deal to 3 years after the deal. The main model is as follows:

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[9] Industry dummy variables are generated based on the Fama-French 48 industries classification.
[10] Propensity-score caliper matching with replacement is employed in this process. To ensure that the treatment and control samples are balanced in size, for each treated observation, up to five matches with the closest propensity scores are retained.

$$Profitability_{i,t} = \alpha + \beta_0 PostDeal_{i,t} + \beta_1 ATO_{i,t} + \beta_2 SalesGrowth_{i,t} + \beta_3 SD_{i,t} * SalesGrowth_{i,t}$$
$$+ \beta_4 Age + \beta_5 MarketShare_{i,t} + \beta_6 Log(Assets)_{i,t} + \beta_7 MTB_{i,t} + \beta_8 Investment_{i,t}$$
$$+ \beta_9 PP\&E_{i,t} + \beta_{10} Zscore_{i,t} + \beta_{11} EquityIssue_{i,t} + \beta_{12} CashHolding_{i,t}$$
$$+ YearFixed\ Effects + IndustryFixed\ Effects + \varepsilon_{i,t}, \tag{2}$$

where the dependent variable is one of the following three main profitability measures under the various model specifications: (1) *EBITDA*, earnings before interests, taxes, and depreciation, scaled by sales; (2) *NTM*, net income, scaled by sales; or (3) *RNOA*, operating income, scaled by beginning net operating assets. *PostDeal* equals 1 if the observation is from the period after a treatment firm receives a new loan and 0 otherwise.

Following the determinant model on operating margin proposed by McVay (2006), I include asset turnover (*ATO*), sales growth, and the interaction term of sales growth and a dummy variable (*SD*) indicating when a firm experiences a sales decline in the concurrent year (*SD*Sales Growth*). Asset turnover has been shown to be negatively related to profit margin (e.g., Nissim and Pennman 2001). I control for the sales down effect on earnings, because prior literature has shown that earnings have a nonlinear relationship with sales growth: costs decrease to a lesser extent when sales decrease compared to when they increase as sales increase (e.g., Anderson et al. 2003; Banker et al. 2018). I also include firm age and market share to control for the impact of a firm's life cycle and market competitiveness on profit margin. Other control variables capture a firm's investment opportunities and financial health. These control variables mitigate concerns that the changes in a borrower's profitability are driven by changes in investment expenditures or the availability of funds after loan financing.

The variable of interest is *PostDeal*. The results reported in Table 4 indicate that the coefficient of *PostDeal* is significantly negative for each model specification. A negative sign for its coefficient indicates that a firm's performance deteriorates after loan originations. In fact, all three profitability measures are significantly lower after loan origination compared with their value prior to loan origination.

[Insert Table 4]

Next, I apply the difference-in-differences research design to examine whether firms receiving new loans experience worse performance, relative to benchmark firms. The main advantages of this approach are that the approach captures both cross-sectional and time-series variations in performance in one step. This approach also mitigates the problem of measurement errors and improves estimation efficiency (Hayashi 2000).

The financial data of the matched control firms pertain to the same time window as those chosen for the corresponding treated firm. The model is specified as follows:
$$Profitability_{i,t} = \alpha + \beta_0 Loan_i + \beta_1 Loan_i * PostDeal_{i,t} + \beta_2 ATO_{i,t} + \beta_3 SalesGrowth_{i,t}$$
$$+ \beta_4 SD_{i,t} * SalesGrowth_{i,t} + \beta_5 Age + \beta_6 MarketShare_{i,t} + \beta_7 Log(Assets)_{i,t}$$
$$+ \beta_8 MTB_{i,t} + \beta_9 Investment_{i,t} + \beta_{10} PP\&E_{i,t} + \beta_{11} Zscore_{i,t} + \beta_{12} EquityIssue_{i,t}$$
$$+ \beta_{13} CashHolding_{i,t} + YearFixed\ Effects + IndustryFixed\ Effects + \varepsilon_{i,t}, \tag{3}$$

where *Loan* equals 1 if a firm is included in the loan sample (treatment group) and 0 otherwise. Other variables have been previously defined.

Table 5 reports the results of the difference-in-differences test. Under each model specification, the

coefficient of *Loan* is insignificantly different from 0. This finding suggests that, prior to financing, the profitability of firms receiving new loans is not significantly different from that of the matched control firms. The coefficient of *Loan*PostDeal* is significantly negative, a result that implies that, after loan originations, the profitability of firms receiving new loans is significantly lower than that of matched control firms. Untabulated F-test results show that the sum of the two coefficients (*Loan + Loan*PostDeal*) is also significantly negative. Combined, these results are consistent with that shown in Table 4. That is, on average, the profitability of firms receiving new loans deteriorates after loan originations, relative to that t of the control firms in the concurrent period.

[Insert Table 5]

4.2. Is Performance Deterioration Incorporated into Credit Terms in Initial Contracts?

The second set of tests examines whether banks expect a decline in borrowers' future profitability at the time of loan origination. If banks can predict adverse changes in future performance based on available public information or if managers truthfully reveal their private information, while applying for loans, credit terms should incorporate this information into the credit terms, because the credit risk is higher for a borrower whose performance is expected to deteriorate, holding everything else equal.

The dummy variable D_EBITDA which equals 1 if the average EBITDA of a firm after loan origination is lower than the average prior to loan origination and 0 otherwise.[11] As a robustness check, I also use the changes in average EBITDA to replace the dummy variable in the model. I examine whether a decline in future performance is significantly associated with the five major contract terms for creditor protection: interest spread, performance pricing, collateral requirements, the total number of financial covenants, and syndication status.

These contract terms are negotiated based on the information that a bank holds at loan origination and on anticipated credit risk. Interest spreads are positively associated with perceived credit risk. Performance pricing provisions can be used as a screening device and reduce negotiation costs when borrowers' financial performance varies after loan origination (e.g., Manso, Strulovici and Tchistyi 2010).[12] Collateral helps banks recover some losses if a borrower is liquidated. The number of financial covenants reflects banks' monitoring intensity. Syndication may reduce the effort exerted by the lead bank in screening borrowers, because default risk is shared with other creditors.

The control variables in the model are commonly used in the literature to capture a firm's investment opportunities (e.g., market-to-book and investment expenditure) credit risk (e.g., leverage and Zscore), asset tangibility (e.g., *PP&E*), and liquidity (e.g., cash holding). I also include an indicator for relationship loans. The degree of information asymmetry is less severe if a borrower has a lending relationship with the lender, and, therefore, a bank may be better informed about the borrower's future performance (e.g., Boot 2000; Bharath et al. 2009).

Table 6 report the results for the association between each of these credit terms and declining future performance, which is captured by the dummy variable (D_EBITDA) and changes in average EBITDA (ΔEBITDA) in Panel A and B, respectively. These control variables are measured as of the year prior to the loan origination. As shown in Panels A and B of Table 6, a decline in future performance is not

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[11] Results are qualitatively similar when dummies of the other two profitability measures are used.

[12] Manso et al. (2010) argue that good-quality borrowers are more likely to accept performance pricing provisions because they are less concerned about how the interest spread will automatically increase because of performance deterioration.

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significantly associated with any of the contract terms in the initial contracts, suggesting that credit terms do not incorporate information about deterioration in future financial performance when banks grant new loans.

[Insert Table 6]

4.3. Performance Deterioration and Renegotiations after Loan Originations

The next analysis reveals whether deterioration in financial performance is unexpected and economically material. A decline in profitability does not necessarily trigger renegotiations when it is anticipated or does not lead to borrowers' defaults. A borrower has incentives to initiate renegotiations for more favorable loan terms when its economic condition improves. However, it will not renegotiate for more stringent terms when its performance deteriorates, unless the company violates contract terms or approaches a violation. Creditors also cannot arbitrarily amend the contract when borrowers have not defaulted on any terms. Hence, if deterioration in borrowers' financial performance, on average, is not economically significant, it should not be significantly associated with loan renegotiations. Alternatively, deterioration in borrowers' financial performance should not significantly increase the frequency of loan renegotiations if banks have already expected it, because such information would be incorporated into the initial contracts. For example, banks allow greater covenant slack for borrowers with lower quality (Demiroglu and James 2010). Renegotiations are largely driven by the arrival of new information rather than by anticipated information (e.g., Aghion, Dewatripont, and Rey 1994).

For this test, I count the number of renegotiations post-loan origination and before the stated maturity, and I calculate the number of days elapsed between the loan origination date and the first renegotiation date. The variable of interest is an indicator for a decline in EBITDA after loan origination. If a decline in EBITDA is unexpected and significantly affects a borrower's creditworthiness, the coefficient of this variable should be significantly positive. I use a Poisson regression to examine the associations, and Table 7 reports the results. An indicator for a decline in EBITDA is positively associated with the total number of renegotiations, but not the number of days elapsed since the first renegotiations. Results are robust when I replace the indicator of EBITDA decline with those for net margin (NTM) and return on net operating assets (RNOA). The results are consistent with the inference that borrowers' deteriorating performance is economically material, and banks have not anticipated a decline. In addition, borrowers who experience deteriorating performance do not necessarily renegotiate with the lender sooner than those who experience improving performance.

[Insert Table 7]

4.4. Performance Deterioration and the Follow-up Contract

In this analysis, I examine whether information on changes in a borrower's performance is incorporated into subsequent loan contracts. The dynamic interactions between a bank and a borrower facilitate the bank verifying and acquiring additional information related to a borrower's creditworthiness. These interactions also increase the bank's monitoring efficiency, as the degree of information asymmetry declines. The interest spread of a followed-up loan contract will reflect the bank's updated evaluation of firm risk based on prior interactions and multiple renegotiations. If the decline in a borrower's financial performance significantly increases the perceived default risk of the borrower, the information is observable to all market participants and is likely to be incorporated into subsequent loans, even if a borrower switches to another bank.

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Using the sample of follow-up contracts described in Table 1, I investigate whether a firm experiencing a decline in profitability after loan origination will face a higher interest spread for the first available loan contract after the observation period. I control for whether the borrower has violated any covenants during the observation period.[13] I do so because lenders may be primarily concerned about the adverse performance changes that led to covenant violations, but not those that have not. In addition, I also control for whether the firm switched lenders for the contract being investigated. If a borrower switches to a new lender, the interest spread in the follow-up contract may be higher, because of greater information asymmetry between the borrower and the new lender, but not the borrower's prior performance deterioration after loan origination. Other firm characteristics are measured as of the year prior to the next loan contract.

Table 8 reports results pertaining to the determinants of interest spreads in follow-up contracts. As shown in Columns (1) and (2), the interest spread is significantly higher if a borrower reports a decline in profitability following the prior loan origination, even if the firm did not violated any covenants. Results reported in Column (3) show that performance deterioration after prior loan origination still results in an additional significant increase in interest spread even when a borrower switches to a different lender, controlling for concurrent firm characteristics. This result implies that a borrower appears to be riskier to the new lender if the firm has reported performance deterioration after receiving the previous loan, holding everything else equal.

[Insert Table 8]

This result is consistent with the theory put forth by Gorton and Kahn (2000), who argue that borrowers experiencing bad performance will face increased interest rates, because lenders perceive these borrowers as carrying higher moral hazard risk. Borrowers' performance following loan origination sends additional signals about the quality of the borrowers' investment projects and helps creditors verify the information communicated to them by firms applying for loans. Because lenders are particularly concerned about adverse news, an unexpected decline in profitability after granting loans appears to lead to a significant decrease in a borrower's perceived creditworthiness during the subsequent contracting process.

4.4. Borrowers' Financial Performance around Loan Restatements

As discussed earlier, information asymmetry, in conjunction with agency conflicts, likely explains the decline in firm performance following loan originations. As the degree of information asymmetry reduces during subsequent lender-borrower interactions, banks become more informed about firms' operations, investments, and management team and, therefore, become more efficient in evaluating and monitoring firms. Consequently, banks draft better contract terms to protect their interests, because long-term contracting promotes learning and improves risk sharing (e.g., Boot and Thakor 1994). Hence, firm performance around loan restatements should not exhibit a pattern similar to that for around loan originations.

This prediction is tested using the model given in Equation (2) and applied to the sample of loan restatements. Table 9 reports the results. The variable of interest is *PostRestate*, which is equal to 1 if the observation pertains to the period after loan restatements and 0 otherwise. As predicted, the profitability measures do not significantly change before and after loan restatements.

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[13] The covenant violation data are sourced from Chava, Fang, and Prabhat (2017), who provide details about the text-search program and descriptive evidence in their paper.

[Insert Table 9]

Overall, the results show that borrowers experience significant deterioration in profitability following loan origination, but not loan restatements. Banks do not seem to anticipate this decline in performance, because the major credit terms in the original loan contracts do not seem to reflect this information. A decline in performance following loan origination is positively associated with the frequency of renegotiations. As information asymmetry reduces over time, a decline in profitability following loan origination increases the perceived borrower risk and leads to a higher interest spread in the follow-up contract, after controlling for concurrent firm characteristics and covenant violation history.

4.5. Additional Analyses and Robustness Checks

Because the sample period spans the 2008–2009 financial crisis, it is possible that the results for borrowers' performance deterioration after loan originations are driven by loans originated shortly before the crisis. To mitigate this concern, I include year fixed effects in all the tests. In addition, I conduct a subsample test by removing new loans originating within 2 years before the 2008 financial crisis. Table 10 reports the results of the difference-in-differences test. My main conclusion remains similar: borrowers still experience significant performance deterioration after loan originations for this subsample.

[Insert Table 10]

To further support the finding that banks are not likely to foresee borrowers' performance deterioration after loan origination, I supplement these analyses with evidence from the equity market. I examine whether a decline in performance is associated with lower abnormal buy-and-hold stock returns (*BHAR*), accumulated over 12 months following loan originations. Note that the results of a significant market reaction pose as a necessary, but not sufficient, condition. It is a conventional belief that banks, compared with the equity market, have greater access to firm private information. If the equity market does not even react to declining performance, the evidence implies that this information is economically immaterial or anticipated. Untabulated results reveal that borrowers experiencing a decline in profitability have significantly lower abnormal BHARs in the year following the loan origination, *ceteris paribus*. Results are robust to all three indicators for performance deterioration. This additional evidence confirms that the equity market views deteriorating profitability as unexpected and economically significant.

5. CONCLUSIONS

In this study, I delineate an unknown pattern in borrowers' financial performance for those taking on medium- to long-term loans. The findings indicate that financing firms experience a significant decline in profitability following loan originations, but not loan restatements. Banks do not seem to anticipate adverse changes in firm performance, because contract terms for creditor protection in initial contracts are not significantly associated with those measures indicating a decline in future profitability. Moreover, firms experiencing deteriorating performance also engage in more frequent loan amendments. These firms also face higher interest spreads when they negotiate loan contracts in subsequent periods.

This study contributes to the literature on information acquisition in lending and dynamic contracting. Prior literature has suggested that banks have expertise in accessing firm private information and can mitigate problems from adverse selection and moral hazard through financial contracting. However,

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information acquisition takes time, and *ex post* renegotiations could affect *ex ante* incentives in contracting. My results show that banks' information advantages and the threat of creditor intervention are limited in effectively differentiating between borrowers' quality at the initial screening stage for new loan applications. Adverse changes in borrowers' financial performance following loan origination are related to *ex post* renegotiations and future contracting. Banks increase monitoring and contracting efficiency over time, even when they have a prior lending relationship with borrowers.

APPENDIX A: VARIABLE DEFINITIONS

Variable	Definition
EBITDA	Operating margin, which equals to operating income before interests, taxes and depreciation expenses, scaled by concurrent sales.
NTM	Net margin, which equals to net income, scaled by concurrent sales.
RNOA	Return on net operating assets, which equals to operating income before interests, taxes and depreciation expenses, divided by beginning net operating assets. Net operating assets are calculated as the difference between operating assets and operating liabilities, where operating assets are total assets less cash and short-term investments and operating liabilities are equal to total assets less total debt, less book value of common and preferred equity, less minority interests.
D_EBITDA	Equals 1 if the average of operating margin after loan origination is lower than that before loan origination, and 0 otherwise.
D_NTM	Equals 1 if the average of net margin after loan origination is lower than that before loan origination, and 0 otherwise.
D_RNOA	Equals 1 if the average of return on net operating assets after loan origination is lower than that before loan origination, and 0 otherwise.
ΔEBITDA	The average of EBITDA after loan origination minus the average ratio before loan origination.
PostDeal	Equals 1 if the observation is from years after which a firm takes on loan financing and 0 otherwise.
Loan	Equals 1 if a firm takes a new loan and 0 otherwise.
Relation	Equals 1 if a borrower has a contract with the same bank within five years prior to the current year and 0 otherwise.
Log(Asset)	The log value of total assets.
ATO	Asset turnover, defined as sales divided by the average net operating assets.
Age	Firm age.
Market Share	The percentage of a firm's sales relative to the total sales of its industry.
MTB	The market value of equity to the book value of common equity.
Leverage	The sum of long-term debt and the debt due in one year, scaled by beginning market value.
Zscore	Altman bankruptcy risk measure.
Sales Growth	Sales growth rate.
SD	Equals 1 if the sales of firm *i* decreased from the prior year and 0 otherwise.
PP&E	Net property, plant, and equipment, scaled by beginning market value.

EquityIssue	The net issuance of equity, scaled by beginning market value. For reporting convenience, I add one to the ratio and take the log value of the sum.
CashHolding	Beginning cash balance, scaled by beginning market value.
Investment	The sum of research and development expenses, capital expenditure, acquisition expenses, and increases in investment, minus the total of sales of investments and sales of property, plant and equipment, scaled by beginning market value.
Violation	Equals 1 if a firm has violated covenants and 0 otherwise.
Switch	Equals 1 if a firm switches to a new lender and 0 otherwise.
Constrained	Equals 1 if a firm is classified as being financially constrained by KZ Index, constructed by Kaplan and Zingales (1997). The index is measured as $-1.002 [(ib + dp)/\text{lag}(ppent)] + 0.283[(at + prcc\_f \times csho - ceq - txdb)/at] + 3.139[(dltt + dlc)/(dltt + dlc + seq)] - 39.3678[(dvc + dvp) / \text{lag}(ppent)] - 1.314759[che /\text{lag}(ppent)]$. Firms are sorted into terciles based on their index values in the previous year. Firms in the top tercile are coded as constrained and those in the bottom tercile are coded as unconstrained.

APPENDIX B: RESULT OF PROPENSITY MATCHING MODEL

This table reports the results of the propensity matching model. *TakeLoan* =1 if a firm takes a new loan at year t and 0 otherwise. All other financial variables are measured as of the year t-1.

VARIABLES	(1) TakeLoan
Log(Assets)	0.423***
	(34.49)
Market-to-Book	0.013***
	(3.64)
Leverage	-0.083***
	(-4.38)
Zscore	0.003
	(1.16)
Sales Growth	0.176***
	(3.63)
Investment	0.442***
	(4.46)
PP&E	0.050
	(1.59)
EquityIssue	-0.007
	(-0.54)
CashHolding	-0.461***
	(-4.16)
Observations	84,266
Pseudo R-squared	0.137
Industry Dummies	YES
Year Dummies	YES

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Table 1: The selection process of sample contracts.

This table reports how loan contracts are selected in this study.

	No. of Original Contracts
Number of original contracts for non-regulated public firms in the merged COMPUSTAT/CRSP database (1996−2014)	7,933
Sample comprising of contracts with a maturity no less than three years	3,929
Sample comprising of contracts with the greatest loan amounts only if there are multiple loan originations in one year	3,037

	No. of Follow-up Contracts
For the same set of sample firms, the number of loan contracts collected between [+3, +6] years following loan origination	2,342

Table 2: Descriptive evidence on financial variables.

This table presents the descriptive evidence on the financial variables of financing firms before and after loan origination. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions.

Variable	Before Loan Origination			After Loan Origination		
	Mean	**Median**	**Std Dev**	**Mean**	**Median**	**Std Dev**
EBITDA	0.064	0.078	0.244	0.062	0.071	0.212
NTM	-0.026	0.043	0.477	-0.039	0.037	0.467
RNOA	0.230	0.222	0.564	0.194	0.196	0.490
MTB	2.970	2.137	3.074	2.711	1.877	3.340
ATO	2.235	1.688	2.406	2.023	1.492	2.155
Market Share	0.021	0.003	0.044	0.025	0.005	0.047
Zscore	4.037	2.954	4.361	3.272	2.620	3.837
Sales Growth	0.266	0.147	0.483	0.170	0.107	0.381
SD	0.180	0.000	0.384	0.256	0.000	0.437
Age	17.410	11.000	15.886	20.687	15.000	16.257
Log(Assets)	7.341	7.314	2.420	8.013	7.987	2.255
Leverage	0.632	0.267	1.248	0.968	0.331	1.887
PP&E	0.664	0.355	0.894	0.747	0.357	1.080
Investment	0.218	0.125	0.283	0.201	0.114	0.269
EquityIssue	0.069	0.002	0.086	0.027	0.003	0.079
CashHolding	0.135	0.069	0.196	0.150	0.074	0.226
Constrained	0.237	0.000	0.426	0.318	0.000	0.466

Table 3: Descriptive evidence on loan characteristics and renegotiations.

Panel A Loan characteristics

This panel shows the loan information of the sample contracts.

Variable	Mean	Median	Std Dev
Spread (in bps)	236.92	175.00	226.68
DealAmt (in MMs)	540.63	140.00	1969.61
Maturity	5.60	5.00	2.83
Syndication	0.75	1.00	0.44
Secured	0.30	0.00	0.46
Relation	0.30	0.00	0.46

Panel B Financing purposes

This panel shows the reported financing purposes of the sample contracts.

Financing Purpose	Frequency Count	Percent of Total Frequency
Corporate purposes	1526	50.2%
Merger & Acquisition	711	23.4%
Working capital	318	10.5%
Project finance	98	3.2%
Capital expenditure	57	1.9%

Panel C Days elapsed since loan origination till first renegotiation

This panel reports the statistics on the number of days between first renegotiation date and loan origination date for all the contracts renegotiated, contracts that are renegotiated for firms experiencing an increase in EBITDA and those experiencing a decrease in EBITDA after loan origination, respectively.

After Loan Origination	Contracts Renegotiated N	No. of Days Elapsed till the 1st Renegotiation		
		Mean	Median	Std Dev
All	1673	564	300	725
Contracts renegotiated and borrowers experiencing an increase in EBITDA	616	554	281	763
Contracts renegotiated and borrowers experiencing a decrease in EBITDA	1057	569	304	703

Table 4: Profitability of financing firms before and after loan origination.

This table reports the panel regression results on profitability before and after loan origination. The dependent variables are four alternative profitability measures. *PostDeal* equals 1 if an observation is from the periods after loan origination and 0 otherwise. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions. Robust t-statistics are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) EBITDA	(2) NTM	(3) RNOA
PostDeal	-0.010***	-0.030***	-0.019*
	(-3.20)	(-4.43)	(-1.82)
ATO	-0.002	0.015***	0.079***
	(-1.12)	(4.35)	(8.67)
Sales Growth	-0.036***	-0.076***	0.051*
	(-4.18)	(-4.54)	(1.69)
SD*Sales Growth	0.518***	1.110***	0.529***
	(9.96)	(10.69)	(5.51)
Age	-0.401**	0.063	-0.931**
	(-2.31)	(0.22)	(-2.32)
Market Share	-0.651***	-0.977***	-1.211***
	(-8.32)	(-6.41)	(-6.01)
Log(Assets)	0.024***	0.043***	0.049***
	(10.47)	(8.89)	(8.96)
Market-to-Book	-0.001	-0.008***	0.009*
	(-1.09)	(-3.66)	(1.94)
Investment	0.044***	0.078***	0.172***
	(5.42)	(4.57)	(7.34)
PP&E	0.014***	0.018***	0.007
	(5.63)	(3.80)	(0.86)
Zscore	0.007***	0.020***	0.033***
	(5.38)	(7.51)	(7.41)
EquityIssue	-0.174***	-0.411***	-0.372***
	(-6.32)	(-6.07)	(-3.28)
CashHolding	-0.111***	-0.192***	-0.218***
	(-6.56)	(-5.60)	(-3.88)
Observations	13,710	13,731	13,721
R-squared	0.278	0.264	0.221
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES

Table 5: Difference-in-differences test on profitability before and after loan origination.

This table reports the difference-in-differences results on the relative changes in profitability of financing firms (treatment sample) before and after loan origination, compared to that of propensity matched control firms (control sample) during the same period. *Loan* equals 1 if a firm is from the loan sample and 0 otherwise. *PostDeal* equals 1 if an observation is from the periods after which a firm takes on loan financing and 0 otherwise. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions. Robust t-statistics are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) EBITDA	(2) NTM	(3) RNOA
Loan	-0.002	-0.011	0.008
	(-0.36)	(-1.12)	(0.61)
Loan*PostDeal	-0.008**	-0.030***	-0.030***
	(-2.01)	(-3.58)	(-2.76)
ATO	0.005***	0.019***	0.062***
	(5.90)	(10.66)	(10.29)
Sales Growth	-0.085***	-0.202***	0.042*
	(-10.05)	(-10.53)	(1.68)
SD*Sales Growth	0.902***	1.921***	0.692***
	(20.60)	(20.75)	(8.50)
Age	-0.253	0.922***	-0.537
	(-1.42)	(3.14)	(-1.64)
Market Share	-1.125***	-1.470***	-1.755***
	(-9.14)	(-6.53)	(-7.83)
Log(Assets)	0.037***	0.060***	0.060***
	(17.03)	(13.81)	(12.56)
Market-to-Book	-0.002**	-0.008***	0.008**
	(-2.53)	(-4.38)	(2.22)
Investment	0.046***	0.061***	0.125***
	(5.10)	(3.15)	(5.34)
PP&E	0.023***	0.033***	-0.002
	(8.47)	(6.29)	(-0.34)
Zscore	0.004***	0.015***	0.021***
	(3.88)	(7.86)	(7.79)
EquityIssue	-0.005***	-0.016***	-0.004
	(-3.23)	(-5.51)	(-0.94)
CashHolding	-0.172***	-0.281***	-0.200***
	(-10.53)	(-9.29)	(-5.00)
Observations	50,186	50,265	50,247
R-squared	0.286	0.259	0.122
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES

Table 6: Contract terms and changes in performance.

This table reports the test results of whether contract terms for creditor protections contain information on a decline in future profitability. The dependent variables are: *Spread*, is the log value of interest spread, *Perf. Pricing* is equal to 1 if the contract includes performance pricing provision and 0 otherwise, *Secured* is 1 if the loan is collateralized and 0 otherwise, *Total FinCov.* is total number of financial covenants and *Syndicated* equals 1 if a loan is syndicated and 0 otherwise. The estimation model used for each dependent variable is indicated at the top of each column. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions. Robust t-statistics are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Panel A
In this panel, I use the dummy variable, D_EBITDA, to capture the decline in future performance.

VARIABLES	(1) Spread	(2) Perf. Pricing	(3) Secured	(4) Total FinCov.	(5) Syndicated
D_EBITDA	0.054	-0.096	-0.125	-0.059	-0.095
	(1.18)	(-0.74)	(-0.98)	(-0.72)	(-0.78)
Relation	-0.309***	0.251*	-0.414***	0.145	0.622***
	(-6.36)	(1.73)	(-2.63)	(1.27)	(4.10)
Log(Assets)	-0.229***	-0.051	-0.503***	-0.283***	0.173***
	(-12.84)	(-1.49)	(-11.49)	(-11.33)	(3.47)
Market-to-Book	-0.011	-0.007	-0.026	-0.033*	0.001
	(-1.34)	(-0.35)	(-1.24)	(-1.90)	(0.02)
Leverage	0.068***	-0.027	0.157**	-0.044	0.048
	(4.13)	(-0.33)	(2.25)	(-0.91)	(0.88)
Zscore	-0.034***	0.044**	-0.045**	0.018*	0.059***
	(-5.15)	(2.56)	(-2.53)	(1.73)	(3.47)
Sales Growth	0.075*	-0.119	-0.134	-0.127	-0.185
	(1.74)	(-0.76)	(-0.95)	(-1.56)	(-1.41)
Investment	0.169**	-0.314	0.136	-0.105	-0.115
	(2.20)	(-1.03)	(0.49)	(-0.64)	(-0.45)
PP&E	-0.038	0.198*	-0.067	0.111*	0.205**
	(-0.98)	(1.75)	(-0.62)	(1.83)	(2.12)
CashHolding	0.300*	-0.977**	0.467	-0.667**	-1.039***
	(1.82)	(-2.02)	(1.20)	(-2.18)	(-2.74)
Constrained	0.191***	-0.284*	0.255*	-0.115	-0.209
	(3.38)	(-1.75)	(1.66)	(-1.03)	(-1.38)
Observations	1,747	2,111	2,098	2,146	2,144
(Pseudo) R-squared	0.368	0.088	0.193	0.159	0.160
Industry & Year FE	YES	YES	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES	YES	YES

Panel B

In this panel, I use the continuous variable, ΔEBITDA, to capture the changes in future performance.

VARIABLES	(1) Spread	(2) Perf. Pricing	(3) Secured	(4) Total FinCov.	(5) Syndicated
ΔEBITDA	-0.147	0.081	0.350	0.075	0.486
	(-0.84)	(0.17)	(0.56)	(0.34)	(1.18)
Relation	-0.308***	0.250*	-0.414***	0.144	0.625***
	(-6.34)	(1.72)	(-2.65)	(1.27)	(4.14)
Log(Assets)	-0.228***	-0.052	-0.506***	-0.284***	0.172***
	(-12.88)	(-1.52)	(-11.73)	(-11.41)	(3.49)
Market-to-Book	-0.011	-0.007	-0.025	-0.033*	-0.000
	(-1.34)	(-0.31)	(-1.23)	(-1.88)	(-0.01)
Leverage	0.066***	-0.025	0.160**	-0.043	0.051
	(4.05)	(-0.30)	(2.29)	(-0.88)	(0.93)
Zscore	-0.034***	0.043**	-0.046***	0.017*	0.059***
	(-5.02)	(2.50)	(-2.60)	(1.66)	(3.48)
Sales Growth	0.077*	-0.118	-0.145	-0.128	-0.205
	(1.76)	(-0.75)	(-1.04)	(-1.54)	(-1.55)
Investment	0.168**	-0.312	0.137	-0.107	-0.107
	(2.17)	(-1.02)	(0.49)	(-0.65)	(-0.41)
PP&E	-0.037	0.197*	-0.066	0.112*	0.207**
	(-0.97)	(1.73)	(-0.62)	(1.85)	(2.12)
CashHolding	0.298*	-0.959**	0.466	-0.662**	-1.059***
	(1.81)	(-1.99)	(1.16)	(-2.16)	(-2.79)
Constrained	0.190***	-0.285*	0.257*	-0.114	-0.205
	(3.36)	(-1.76)	(1.68)	(-1.02)	(-1.36)
Observations	1,747	2,111	2,098	2,146	2,144
R-squared	0.368	0.088	0.193	0.159	0.161
Industry & Year FE	YES	YES	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES	YES	YES

Table 7: The frequency and timing of renegotiations.

This table reports the results on whether performance decline following loan origination is associated with the frequency of loan renegotiations and the time to the first renegotiation. The dependent variable for Column (1) to (3) is the total numbers of renegotiations following a loan origination. The dependent variable for Column (4) to (5) is the total numbers of days since the loan origination date to the date of the first renegotiation. All the models are Poisson regression. *Spread*, is the log value of interest spread, *Perf. Pricing* is equal to 1 if the contract includes performance pricing provision and 0 otherwise, *Secured* is 1 if the loan is collateralized and 0 otherwise, *Total FinCov.* is total number of financial covenants and *Syndicated* equals 1 if a loan is syndicated and 0 otherwise. See Appendix A for other variable definitions. All financial variables are inflation adjusted and are winsorized at the top and bottom 1% level. Robust z-statistics are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	No. of Renegotiations			No. of Days		
D_EBITDA	0.175**			-0.065		
	(2.00)			(-0.96)		
D_NTM		0.229***			-0.095	
		(2.75)			(-1.40)	
D_RNOA			0.267***			-0.045
			(2.87)			(-0.56)
Relation	0.236**	0.231**	0.279**	-0.213***	-0.218***	-0.235***
	(2.22)	(2.20)	(2.27)	(-2.99)	(-3.04)	(-2.93)
Log(Assets)	-0.013	-0.008	-0.014	0.015	0.014	0.016
	(-0.49)	(-0.30)	(-0.51)	(0.57)	(0.52)	(0.55)
Market-to-Book	0.004	0.004	-0.003	-0.005	-0.005	0.011
	(0.32)	(0.32)	(-0.25)	(-0.40)	(-0.39)	(0.82)
Leverage	-0.041	-0.046	-0.034	0.010	0.011	0.005
	(-1.30)	(-1.47)	(-0.93)	(0.35)	(0.40)	(0.16)
Zscore	-0.024**	-0.025**	-0.023*	0.014	0.014	0.007
	(-2.01)	(-2.05)	(-1.82)	(1.56)	(1.53)	(0.75)
Sales Growth	0.021	0.013	0.007	-0.216**	-0.213**	-0.189*
	(0.29)	(0.17)	(0.10)	(-2.08)	(-2.07)	(-1.74)
Investment	0.351**	0.344**	0.344**	-0.275*	-0.265*	-0.348**
	(2.27)	(2.20)	(2.07)	(-1.76)	(-1.71)	(-2.11)
PP&E	0.017	0.024	0.018	0.013	0.012	0.017
	(0.27)	(0.37)	(0.26)	(0.22)	(0.20)	(0.27)
CashHolding	0.159	0.165	0.193	0.122	0.112	0.108
	(0.41)	(0.43)	(0.48)	(0.59)	(0.54)	(0.50)
Constrained	0.265**	0.274**	0.260**	-0.323***	-0.326***	-0.307***
	(2.49)	(2.56)	(2.44)	(-3.41)	(-3.43)	(-3.00)
Spread	0.391***	0.387***	0.408***	-0.194***	-0.193***	-0.158***
	(7.91)	(7.78)	(6.68)	(-4.00)	(-3.99)	(-2.81)
Perf. Pricing	0.274*	0.277*	0.310**	-0.121	-0.119	-0.127
	(1.83)	(1.85)	(2.02)	(-1.38)	(-1.36)	(-1.27)
Secured	-0.064	-0.076	-0.027	0.016	0.022	-0.039
	(-0.60)	(-0.72)	(-0.23)	(0.19)	(0.26)	(-0.43)
Total FinCov.	0.070	0.071	0.073	0.062*	0.061*	0.074**
	(1.01)	(1.02)	(0.99)	(1.91)	(1.87)	(2.11)
Syndicated	0.246**	0.236**	0.267**	-0.081	-0.076	-0.072
	(2.35)	(2.29)	(2.34)	(-0.80)	(-0.76)	(-0.67)
Observations	1,747	1,749	1,532	1,068	1,068	910
Pseudo R- Squared	0.212	0.214	0.230	0.203	0.204	0.205
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES	YES	YES	YES

Table 8: Performance deterioration and interest spread in the next loan contract.

This table reports the test results on the association between a performance decline after loan origination and the interest spread in following loan. The dependent variable, *Spread*, is the log value of interest spread in the first observed loan contract after three years following loan origination. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions. Robust t-statistics are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) Spread	(2) Spread	(3) Spread
D_EBITDA	0.130**	0.130**	0.126**
	(2.14)	(2.15)	(2.11)
Violation		0.161**	0.155**
		(2.00)	(1.97)
Switch			0.208***
			(4.41)
Log(Assets)	-0.198***	-0.192***	-0.190***
	(-7.42)	(-6.92)	(-6.91)
Market-to-Book	-0.004	-0.004	-0.004
	(-1.41)	(-1.43)	(-1.37)
Leverage	0.013***	0.013***	0.013***
	(3.45)	(3.39)	(3.46)
Zscore	-0.075***	-0.074***	-0.074***
	(-3.69)	(-3.69)	(-3.74)
Sales Growth	-0.097	-0.096	-0.097
	(-1.22)	(-1.21)	(-1.19)
Investment	0.001***	0.001***	0.001***
	(4.82)	(4.85)	(4.92)
PP&E	-0.001**	-0.001**	-0.001**
	(-2.47)	(-2.49)	(-2.49)
CashHolding	0.005**	0.005**	0.005**
	(2.10)	(2.12)	(2.12)
Constrained	0.252***	0.248***	0.242***
	(4.06)	(4.00)	(3.98)
Observations	2,342	2,342	2,342
R-squared	0.424	0.425	0.431
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES

Table 9: Profitability of financing firms before and after loan restatements.

This table reports the panel regression results on profitability before and after loan restatements. The dependent variables are three alternative profitability measures. *PostRestate* equals 1 if an observation is from the periods after loan restatement and 0 otherwise. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions. Robust t-statistics are in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

VARIABLES	(1) EBITDA	(2) NTM	(3) RNOA
PostRestate	-0.001	-0.002	-0.016*
	(-0.34)	(-0.37)	(-1.67)
ATO	-0.011***	-0.007***	0.043***
	(-5.39)	(-2.82)	(5.42)
Sales Growth	0.019**	0.006	0.126***
	(1.97)	(0.39)	(4.37)
SD*Sales Growth	0.132***	0.376***	0.257***
	(3.87)	(3.93)	(3.55)
Age	-0.398**	0.324	0.246
	(-2.24)	(1.38)	(0.53)
Market Share	-0.085	-0.323**	-0.137
	(-1.57)	(-2.15)	(-0.84)
Log(Assets)	0.008***	0.012***	0.014***
	(3.30)	(3.25)	(2.79)
Market-to-Book	0.001**	-0.001	0.013***
	(2.50)	(-1.04)	(4.75)
Investment	0.023***	0.037*	0.113***
	(3.32)	(1.95)	(6.25)
PP&E	0.000	-0.005	-0.010***
	(0.19)	(-1.64)	(-3.29)
Zscore	0.006***	0.023***	0.042***
	(6.12)	(10.59)	(9.39)
EquityIssue	-0.006	-0.090*	-0.135**
	(-0.23)	(-1.85)	(-2.01)
CashHolding	-0.013***	0.021**	-0.005
	(-2.97)	(2.04)	(-0.56)
Observations	5,795	5,795	5,795
R-squared	0.508	0.245	0.494
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES

Table 10 Difference-in-differences test on profitability on the subsample.

This table reports the difference-in-differences results on the relative changes in profitability of financing firms (treatment sample) after removing loans originated within two years before 2008 financial crisis, compared to that of propensity matched control firms (control sample) during the same period. *Loan* equals 1 if a firm is from the loan sample and 0 otherwise. *PostDeal* equals 1 if an observation is from the periods after which a firm takes on loan financing and 0 otherwise. All variables are inflation adjusted and are winsorized at the top and bottom 1% level. See Appendix A for detailed definitions. Robust t-statistics are in parentheses *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) EBITDA	(2) NTM	(3) RNOA
Loan	-0.003	-0.013	0.003
	(-0.56)	(-1.23)	(0.21)
Loan*PostDeal	-0.008**	-0.029***	-0.030**
	(-2.09)	(-3.42)	(-2.50)
ATO	0.005***	0.018***	0.059***
	(5.45)	(10.22)	(9.70)
Sales Growth	-0.082***	-0.197***	0.048*
	(-9.48)	(-9.81)	(1.85)
SD*Sales Growth	0.904***	1.956***	0.720***
	(19.86)	(20.31)	(8.33)
Age	-0.223	1.024***	-0.395
	(-1.21)	(3.39)	(-1.16)
Market Share	-1.069***	-1.292***	-1.782***
	(-8.23)	(-5.42)	(-7.42)
Log(Assets)	0.035***	0.055***	0.061***
	(16.06)	(12.50)	(12.79)
Market-to-Book	-0.002**	-0.008***	0.008**
	(-2.11)	(-3.89)	(2.14)
Investment	0.041***	0.052***	0.120***
	(4.43)	(2.63)	(5.08)
PP&E	0.022***	0.033***	-0.004
	(8.12)	(6.28)	(-0.53)
Zscore	0.004***	0.013***	0.022***
	(3.20)	(6.84)	(7.92)
EquityIssue	-0.005***	-0.016***	-0.004
	(-3.05)	(-5.34)	(-1.10)
CashHolding	-0.169***	-0.273***	-0.194***
	(-9.93)	(-8.94)	(-4.68)
Observations	45,027	45,106	45,077
R-squared	0.285	0.260	0.126
Industry FE	YES	YES	YES
Year FE	YES	YES	YES
S.E. Clustered by Firm	YES	YES	YES

Figure 1: Timeline for contracts collected.

This figure illustrates the timeline of contracts used in the study. The main sample is loan origination sample, which consists of firms applying for loans with a maturity of at least three years. The loan contracts collected are the initial contracts and financial variables pertaining to the period spanning three years prior to loan origination to three years afterwards. For the sample firms that have taken new loans, I also collect the first contract observed after the observation period but within six years since the loan origination (i.e., the follow-up contract)