Monitoring with Small Stakes *

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Abstract

This paper proposes a mechanism to address the issue of "monitoring with small stakes" in syndicated lending. We identify two sources that incentivize creditor monitoring: skin-in-the-game and rent extraction from renegotiation. Renegotiation-based rent extraction serves a substitute to banks' loan stake for monitoring incentives, facilitating institutional investors' participation in syndicated lending. We use the passage of a tax policy that exogenously reduced renegotiation frictions to identify this channel. Our findings suggests that a less frictional renegotiation environment leads to more diligent monitoring, smaller bank shares in new loans and improved borrower performance, particularly in pre-existing deals with lower bank skin-in-the-game.

Keywords: contract theory, renegotiation, monitoring, rent extraction, institutional loans, cov-lite, covenants, fiscal policy, control rights, leveraged loans

JEL codes: G21, G23, G30

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1 Introduction

This paper addresses a puzzle in the financial contracting literature: how do banks maintain their monitoring incentives when they have low loan retention? Canonical contract theory models propose that moral hazard and adverse selection issues are mitigated when creditors retain a sufficiently large stake in their originations.[1] This is because having more "skin in the game" provides banks with stronger incentives to closely monitor borrowers and minimize default risk, which ultimately leads to increased debt capacity for borrowers.[2]

Over the past decade, institutional investors have increasingly participated in syndicated lending, challenging the traditional loan retention mechanism. The leveraged loan market, which features borrowers with greater agency conflicts, requires effective creditor monitoring. However, this market is characterized by high syndicate participation from institutional investors who lack monitoring capabilities, resulting in lower banks' stake in originated loans.[3] This presents a puzzle: how are banks' monitoring incentives preserved with low skin in the game and multiple creditor classes of equal priority? More broadly, are banks special in their capacity of serving as credible monitors, or are they arms-length?

We propose a novel mechanism to explain the *monitoring with small stakes* puzzle by conceptualizing two sources of incentive provision for costly creditor monitoring. The first source is the traditional "skin in the game" channel, where creditors monitor to safeguard their claims' and collateral's salvage value (e.g., Holmstrom and Tirole (1997); Gorton and Pennacchi (1995)). The second source is the ability of creditors to extract rents from borrowers during renegotiation, which enhances monitoring incentives. This is because creditors' incentives to monitor borrowers increase when they anticipate a higher payoff from rent extraction during renegotiation, which is often triggered by their monitoring activities. While the former source is well-established in the literature, our analysis focuses on the latter source as a novel explanation for the puzzle.

When the monitoring creditor (e.g., *bank*) holds a small stake, his incentive to monitor is ambiguous as the payoff from protecting the salvage value is limited. To credibly communicate with and convince the non-monitoring creditors (e.g., *institutional investors*) of a low borrower default risk, which requires diligent monitoring that cannot be verified

[1] See, e.g., Gorton and Pennacchi (1995), Holmstrom and Tirole (1997), Parlour and Plantin (2008).

[2] The financial contracting literature shows that creditors' incentives in conducting costly monitoring impacts borrowers' debt capacity, see e.g., Diamond (1984), Diamond (1991), Rajan and Winton (1995), Park (2000).

[3] As a result, loan contracts have evolved into split control deals which pair covenant-lite term loans, primarily held by institutional investors, with covenant-laden revolving credit, primarily held by banks (Berlin et al. (2020)). In practice, split control agreements delegate the exclusive right to monitor and renegotiate financial covenants to banks.

by others, the monitoring creditor must be able to generate a sufficiently high payoff from the rent extraction process during renegotiation. We demonstrate that banks' monitoring efforts are sensitive to their bargaining positions and frictions in the renegotiation process, with this sensitivity increasing as banks' own stake in the loan decreases. Relatedly, reducing renegotiation frictions or enhancing creditors' bargaining positions can facilitate the ex-ante underwriting of credit contracts in which banks have small stakes, particularly for borrowers subject to severe agency conflicts – a key conjecture we empirically test.

Therefore, we contend that the renegotiation-based mechanism serves as an alternative source and potential substitute for the stake-based mechanism in providing monitoring incentives and facilitating the participation of non-monitoring creditors in leveraged lending. This framework helps to explain how monitoring creditors can credibly commit to monitoring borrowers despite holding a minority share of the origination, which in turn encourages non-monitoring creditors to join in and take up a significant share of the origination.[4]

Relatedly, this paper demonstrates that renegotiation is an endogenous equilibrium outcome rather than an out-of-equilibrium phenomenon à la Maskin and Moore (1999). Conceptually, renegotiation has been largely viewed or modeled as an exogenous game with ex post surplus available under unanticipated or noncontractable states of the world (e.g., Aghion and Bolton (1992); Hart and Moore (1998a)). In contrast, our proposed mechanism highlights the endogenous nature of renegotiation by linking its occurrence and outcomes to creditors' monitoring incentives.

We utilize our theoretical framework to conduct empirical analysis in the context of the leveraged loan market. In recent years, there has been a significant shift in lender composition in this market, with non-bank institutional investors increasingly participating while banks' participation has greatly reduced.[5] This market has also witnessed the emergence of split control deals, where banks hold the revolving credit with covenants and are responsible for monitoring and renegotiation.[6] Moreover, the leveraged segment experienced the most rapid growth within the syndicated loan market. The leveraged loan market has grown rapidly, representing up to 45% of the syndicated loan market, making it an ideal setting to examine loan contracts when lenders have different monitoring capabilities and skin in the game (Goel

[4]This "monitoring the monitor" problem is made clear in Diamond (1984) which highlights the incentive problem of a bank that behaves as a delegated monitor and demonstrates how debt contracts can mitigate such incentive problem. This incentive problem is later examined in other contexts and with other types of solutions (e.g., Rajan and Winton (1995), Park (2000), Dang et al. (2017)).

[5]As pointed out by IMF Global Financial Stability Report 2019, bank lenders' share in leveraged loan market has declined from 70% in mid 1990s to 10% in 2018, while non-bank lenders' share has grown to more than 85% till 2018. A report from S&P Global documented a similar trend.

[6]As thoroughly documented and explored by Berlin et al. (2020), split control agreements delegate the exclusive right to monitor and renegotiate financial covenants to banks.

(2018)).

Our empirical analysis aims to identify whether the increased expected payoff from ex-post rent extraction in renegotiation better commits creditors to conduct monitoring activities, and thus allows for a smaller stake held by banks. Identifying this mechanism is empirically challenging. To achieve this goal, one would need to exploit shifters that affect creditors' ability to renegotiate or other factors determining their net payoff from renegotiation-based rent extraction. However, such shifters are likely endogenous and could be correlated with other factors that also affect the contractual and performance outcomes of underwritten loans, making it difficult to identify the channel in a clean manner.

We utilize the activation of TD9599 tax credit as a natural experiment that effectively lowers (increases) creditors' net cost (payoff) of renegotiation.[7] This tax policy redesignated syndicated loans as publicly traded debt in late 2012, lowering the tax burden for creditors. For the sake of simplicity, we will refer to the increases (decreases) in expected payoff (net cost) resulting from the policy as "reduction in ex-post renegotiation friction" throughout the remainder of this paper. We combine this natural experiment with cross-sectional variation in banks' skin in the game. In particular, we use the split control status of loan deals as a proxy for bank skin in the game; the average bank commitment share in split control deals is 22%, compared to 71% for non-split control deals.[8] Using a difference-in-differences (DiD) design, we identify the impact of this policy-induced reduction in renegotiation frictions on both the ex ante contractual design of newly issued loans and the ex post performance of pre-existing loans.

One key empirical prediction of our analysis is that banks have greater incentives to monitor borrowers when they expect a greater payoff from rent extraction during renegotiation, and the sensitivity of this effect is higher in loans where banks hold smaller shares. To this end, we directly study how the passage of the tax policy differentially affects renegotiation outcomes for split and non-split control deals. We provide direct evidence of rent extraction via the renegotiation channel by comparing the loan renegotiation outcomes and creditor actions around the tax policy. We find that after the tax policy, lenders of split control deals are more likely to accelerate borrower repayments, increase interest rates, demand extra borrowing base provision, include extra covenants, or charge extra amendment fees compared to lenders of non-split control deals. Overall, our findings suggest a strengthened position in lenders' renegotiation with their borrowers after the passage of the tax event.

[7]The impact of this tax policy on the renegotiation of corporate loans has been examined in other papers including Campello et al. (2018) and Ferracuti and Morris (2017).

[8]To overcome the limited coverage of information on each lender's share in a syndicated loan deal within major databases like Dealscan and SDC Platinum, we utilize split control status as a proxy for bank skin in the game. This approach enables us to analyze a larger sample size without compromising generality.

While our results indicate that an exogenous reduction in renegotiation costs is associated with greater payoffs during renegotiation for split control deals compared with non-split control deals after the tax policy, it is unclear whether these creditor-favorable outcomes are driven by changes in bank monitoring. In a more direct investigation of the bank monitoring channel, following Gustafson et al. (2021), we construct three measures of lenders' monitoring intensity. We find that split control deals are more likely to require the delivery of financial statements, more likely to have agent banks conduct field examination requests, and request financial statement submissions with higher frequency relative to non-split control deals, after the tax policy. Hence, we provide direct evidence in support of our mechanism that banks' monitoring intensity increases when they expect high payoff from renegotiations triggered by their monitoring activities.

After establishing its impact on ex post renegotiation outcomes and creditor monitoring, we investigate how reduced frictions in ex post renegotiation affect the ex ante design of credit contracts in the leveraged loan market. Covenants are an important mechanism through which monitoring-induced renegotiation is triggered (Rajan and Winton (1995)). We find that split control deals include more covenants overall, and after the tax policy, split control deals are more likely to have debt-to-ebitda ratio, interest coverage ratio, fixed charge coverage ratio, and debt issuance covenants than non-split control deals. Furthermore, split control deals are also more likely to be renegotiated and amended, and experience more rounds of renegotiation after the passage of the tax policy compared to non-split control deals.

We further examine the impact of the tax policy on other contractual features of newly issued loan deals. When renegotiation frictions are reduced, we posit that banks can extract greater payoff through the renegotiation channel. Hence, we test whether that banks rely more on ex post compensation rather than ex ante compensation, after the tax policy. We find that the tax policy reduces upfront fees and commitment fees for split control deals more than non-split control deals. Consistent with our theoretical predictions, this structural shift in the compensation scheme suggests that credit contracts with relatively lower reliance on stake-based incentive provision (e.g., split control deals) are more sensitive to changes in renegotiation environments.

We also explore how the severity of potential agency conflicts and the implied necessity of efficient monitoring interacts with the impact of the policy change. We find that after the tax policy, split control deals are less likely to rely on the presence of private equity as an external monitor. Specifically, we find that split control deals experience larger declines in the likelihood of private equity sponsors, the likelihood the deal is used towards buyout activities, and the likelihood that the deal uses unitranche financing after the tax policy. On

the extensive margin, we hypothesize that creditors' improved commitment to monitor allows marginal borrowers who are subject to severe agency problems to enter the credit market, pushing forward the boundary of the leveraged loan market. Consistent with our hypothesis, we find that split control deals are more likely to be issued to speculative borrowers relative to non-split control deals, after the tax policy. These findings demonstrate that banks can better commit to monitor borrowers after the tax policy, even when they only hold small stakes in originated loans.

It is also predicted by our model that when renegotiation friction is low (high), banks rely less (more) on revolving credit in split control deals to incentivize monitoring. This is because reductions in renegotiation frictions enhance banks' ability to extract rents during renegotiation, which hence reduces banks' reliance on invoking the threat of canceling borrowers' access to the unused credit line to attain a favorable bargaining position in renegotiation. We empirically test this conjecture and find that split control deals report a larger decline in revolving credit shares relative to non-split control deals, after the tax policy.

To supplement our analysis of the policy impact on the underwriting of newly issued loan deals, we also examine how the loan outcome and performance of borrowers vary around the policy event for existing loan deals. We find that firms with split control deals on their balance sheet experienced larger increases in return on assets (ROA) and reduction in default probabilities after the tax policy, compared to non-split control firms. Furthermore, these firms are also found to experience larger reductions in debt-to-ebitda ratio and net debt issuance, while a more pronounced increase in retained earnings and sales compared to their non-split control counterparts.

These findings have important policy implications. Our results suggest that fiscal policies aimed at reducing renegotiation frictions can facilitate institutional investor participation in the leveraged loan market and potentially expand the credit market. Our analysis also has important implications beyond the leveraged loan market. For instance, our findings on bank lenders' use of revolving credit suggests in situations where renegotiation is highly frictional, bank lenders may rely heavily on revolving facilities to commit to monitoring, increasing the banking sector's vulnerability to demand-side liquidity shocks.

Related Literature. This paper contributes to three strands of the literature. First, we develop a theoretical model which provides an explanation behind the *monitoring with small stakes* puzzle. Second, we provide empirical evidence, demonstrating how ex post renegotiation affects ex ante contract design and borrower outcomes. Third, we build on the extant literature on the split control structure of loan contracts.

Financial intermediaries reduce agency frictions to facilitate credit, but information asymmetries between lenders and investors can lead to moral hazard issues that hinder credible

communication. Delegation costs associated with incentive compatibility of delegated monitors to conduct non-verifiable monitoring activities were first recognized in Diamond (1984).[9] Gorton and Pennacchi (1995), Holmstrom and Tirole (1997), and Gryglewicz et al. (2021) propose that lenders retain a sufficient share of loan originations (*skin in the game*) to align incentives between investors and lenders and increase borrowers' debt capacity. Recent empirical studies (e.g., Sufi (2007), Gustafson et al. (2021)) document that banks retain a larger share of loans that require more monitoring to credibly commit to monitoring. However, the recent rise of institutional lending raises the concern that banks may have insufficient skin in the game (e.g., Wang and Xia (2014); Bord and Santos (2012)).[10]

The importance of ex post renegotiation on ex ante contractual structure is emphasized in the theoretical financial contracting literature, but empirical studies on renegotiation are limited.[11] For instance, Roberts and Sufi (2009) find that over 90% of long-term loan contracts are renegotiated before maturity and that renegotiation is rarely due to distress or default. The authors suggest that ex ante contractual contingencies can affect the bargaining power of the contracting parties in renegotiation. However, the empirical literature on how ex post creditor control affects ex ante capital structure decisions is constrained by two primary challenges. First, it is challenging to identify suitable variation to generate precise predictions from theory because renegotiation outcomes are rarely exogenous. Second, it is difficult to measure renegotiation or the inclination to renegotiate. We overcome these obstacles by using the passage of TD9599 as an experimental setting. We provide direct evidence that a reduction in renegotiation costs leads to an increase in banks' monitoring activities, which in turn generates higher payoffs during renegotiation. This paper provides one of the first pieces of empirical evidence on the impact of ex post renegotiation on ex ante credit contracting and firm outcomes.

Our analysis also contributes to the growing literature on split control arrangements in the leveraged loan market, building upon findings by Berlin et al. (2020). Berlin et al. (2020), documents that cov-lite loans are almost always paired with revolving lines of credit that

[9] Diamond (1984) shows that diversification with debt contracts can optimally alleviate the incentive problem, by making the delegated monitor's payoff most sensitive to her monitoring action. The analysis in our paper shares a similar insight – essentially, one needs either a large enough stake or sufficient ability to extract rents from monitoring-triggered renegotiations to make the delegated monitor's payoff sensitive to her monitoring action.

[10] Drucker and Puri (2009) show that 60% of loans are sold within one month of origination and nearly 90% within one year. Billett et al. (2016) demonstrates that when banks' skin in the game is small enough, the conflict of interest between banks and institutional investors becomes so severe that the optimal contract grants institutional investors enforcement control, allowing institutional investors to entirely remove the covenants under certain conditions.

[11] See e.g., Bolton and Scharfstein (1996), Hart and Moore (1998b), Garleanu and Zwiebel (2009) for theoretical papers.

have traditional financial covenants.[12] Consistent with their findings, we find that banks do conduct monitoring under the split control arrangement. Specifically, we investigate how the design of credit contracts incentivize monitoring under split control and non-split control arrangements. Our study builds upon the findings of Berlin et al. (2020) by providing evidence that in deals with lower levels of bank skin in the game, renegotiation-based rent extraction serves as a strong alternative to bank skin in the game in incentivizing monitoring efforts.

The rest of the paper is organized as follows. Section 2 develops a conceptual framework to highlight the renegotiation-based channel when the stake-based channel is limited in providing monitoring incentives. We then bring the theory to the empirics. Section 3 describes the data and sample construction. Section 4 conducts a preliminary examination of the leveraged loan market, which has experienced a substantial inflow of non-monitoring institutional investors, and compare the characteristics of loan deals where banks hold relatively small shares (split control deals) to those where banks hold relatively high shares (non-split control deals). In Section 5, we empirically identify this novel channel by conducting an event-based analysis in which we exploit an exogenous reduction in renegotiation frictions to study its impact on the contractual and performance outcomes in the leveraged loan market. Section 6 concludes the paper.

2 A Conceptual Framework of Monitoring and Renegotiation

This section develops a framework of debt financing in which borrowers are subject to agency problems. Consider a setting in which an entrepreneur has a project that needs to be financed externally. All players in this economy are risk neutral and the risk free rate is r. There are three relevant dates:

i On date 0, the entrepreneur needs to raise funding I to get the project initiated;

ii At some randomly arrived interim date 1, the entrepreneur has the opportunity to engage in certain "asset diverting" behavior;

iii On date 2, the project pays off.

[12] See Berlin et al. (2020) and Becker and Ivashina (2016) for the increasing application of split control arrangement and cov-lite credit agreements in leveraged loan market. It is argued this particular contractual feature is designed to alleviate coordination problems with institutional investors. The blue line in Figure 2 shows that the dollar proportion of leveraged loans has been rising and reached about 50% of the total volume of split control deals.

The main agency problem in this setting is captured by the entrepreneurs' option regarding project choice on date 1. Specifically, we assume that the project generates a payoff of X_H, which is fully pledgeable to creditors if the entrepreneur is well-behaved. However, once the entrepreneur utilizes the opportunity to turn the project into a "bad" one, the project generates a total payoff of X_L, which is strictly lower than X_H. Moreover, only a $\gamma < 1$ fraction of X_L is pledgeable and can be seized by the creditor. Under this specification, parameter γ essentially captures the severity of the agency problem.[13]

A. Benchmark framework with single creditor

Let us begin our analysis by considering the scenario where there is a single creditor who conducts financing and potentially monitors the entrepreneur. We will examine how the monitoring incentives of this single creditor impact the entrepreneur's borrowing ability, and how these incentives are influenced by renegotiation dynamics.

Contracting without monitoring. To highlight the central role played by the creditor monitoring in determining borrowers' debt capacity, we first consider credit contracts without creditor monitoring. In the absence of monitoring, once the entrepreneur gets the opportunity to divert the project, she will exercise this option and turn the project into a bad one if and only if

$$X_H - D \leq X_L - \gamma X_L$$

where D is the face value of debt payment the entrepreneur is obligated to make. As such, without monitoring the maximum payment that ensures the entrepreneur does not divert the project is

$$D^u = X_H - (1-\gamma)X_L \tag{1}$$

The project can be financed if and only if the lender's cost of capital does not exceed this maximum payment the entrepreneur can promise without diversion, i.e.,

$$rI \leq D^u. \tag{2}$$

It is easy to see that entrepreneurs with severe agency problems, (i.e., small γ) are unlikely to get financed because a smaller γ makes condition 2 more likely to fail. In particular, only entrepreneurs with $\gamma \geq \gamma^u$ can receive financing without monitoring, where $\gamma^u \equiv 1 - \frac{X_H - rI}{X_L}$.

[13] The notion that only a fraction of the entrepreneur's payoff is pledgeable as payments to the lender follows the previous literature in incomplete contracting such as Hart and Moore (1998b) and Berglöf and Von Thadden (1994).

Contracting with monitoring. Now suppose that the creditor can conduct costly monitoring to prevent such opportunistic behavior of borrowers. Specifically, we assume that the creditor is able to identify with probability θ, the instant that the entrepreneur gets the opportunity to convert the project, by incurring a monitoring cost of $c(\theta)$, where function $c(\theta)$ satisfies $c'(\theta) > 0$ and $c''(\theta) > 0$.[14] In our following analysis, we consider quadratic monitoring cost $c(\theta) = \frac{c}{2}\theta^2$ with $c > 0$. When the detection fails, which occurs with probability $1-\theta$, the entrepreneur has the opportunity to decide whether or not she wants to divert the project.

In the state where the creditor successfully detects the arrival of the entrepreneur's asset diversion opportunity, two possible scenarios arise. In the first scenario, which occurs with probability p, the project diversion opportunity is automatically eliminated. When this occurs, the project remains in the good state and generates a fully pledgeable payoff of X_H. In the second scenario, which occurs with probability $1-p$, the project diverting opportunity cannot be eliminated unless the entrepreneur is willing to forgo it. In this case, renegotiation occurs, as it strictly improves the total surplus between the creditor and the entrepreneur (since $X_H > X_L$). To highlight the "equally" important role in providing monitoring incentives of these two channels, we set $p = \frac{1}{2}$ in the following analysis.

We assume that the renegotiation outcomes follow a Nash bargaining solution, where the creditor is able to obtain a $\beta \in [0,1]$ fraction of the surplus in negotiation. This parameter, β, can be thought of capturing the relative bargaining power as well as other potential frictions in the negotiation process.[15] Under this specification, the payoff to the creditor after renegotiation is

$$V_C = \gamma X_L + \beta(X_H - X_L)$$

In determining the optimal monitoring effort θ, a creditor solves

$$\max_{\theta} \theta\left(\frac{1}{2}D + \frac{1}{2}V_C\right) + (1-\theta)\gamma X_L - c(\theta)$$

The optimality condition of monitoring effort thus implies

$$\frac{1}{2}\underbrace{(D - \gamma X_L)}_{\text{salvage value recovery}} + \frac{1}{2}\underbrace{(V_C - \gamma X_L)}_{\text{rent extraction}} = c'(\theta)$$

[14] The notion that creditors can detect borrowers' opportunistic behavior through conducting costly monitoring is similar to that in Acharya et al. (2014), in which bank monitoring can generate noisy signals, revealing firms' project choice.

[15] The ex post renegotiation between creditors and borrowers is modeled as two parties bargain to split the surplus generated by renegotiation, similar to that in Bolton and Scharfstein (1996).

or

$$\frac{1}{2}(D-\gamma X_L)+\frac{\beta}{2}(X_H-X_L)-c'(\theta)=0. \tag{3}$$

The above equation highlights the two sources that provide incentives for creditors to monitor. The first source comes from the recovery of the salvage value, which is obtained by creditors when their monitoring activities can immediately eliminate the borrowers' diversion opportunity. The second source of incentive provision is determined by the creditors' ability to extract rents from the renegotiation triggered by creditors' monitoring activities. This second source is relevant when the diversion opportunity cannot be eliminated automatically and hence, a certain fraction of the surplus needs to be shared with the entrepreneur to "bribe" her to not divert the project.

In our later empirical analysis, we are interested in studying how a policy shock influencing frictions in the renegotiation process (e.g., change in β) affects both ex-post loan outcomes and ex-ante loan contracting, by affecting banks' monitoring incentives. We define the following elasticity

$$\epsilon_{\theta,\beta} \equiv \frac{d\theta}{d\beta}\cdot\frac{\beta}{\theta}$$

to capture the sensitivity of bank's monitoring effort to changes in renegotiation frictions. It is easy to see that $\epsilon_{\theta,\beta}>0$.

Denote the optimal screening as a function of the face value payment D, $\theta^*=\theta^s(D)$, where superscript "s" indicates the loan is supplied by a single creditor. It is easy to see that $\frac{\partial\theta^s}{\partial D}>0$. That is, a higher face value payment provides greater incentives for the creditor to conduct monitoring. As such, the ex ante choice of face value D is set such that the creditor can at least break even at this optimal level of monitoring effort:

$$\theta^s(D)\left(\frac{1}{2}D+\frac{1}{2}V_C\right)+\left[1-\theta^s(D)\right]\gamma X_L-c\left(\theta^s(D)\right)\geq rI \tag{4}$$

It becomes readily apparent that the LHS of the above equation is strictly increasing in D. Since the face value D of the payment cannot exceed the project payoff in the good state X_H, we can thus determine the boundary of borrowers entering the credit market:

Proposition 1. *With a single creditor who can monitor, a borrower can be financed if and only if $\gamma\geq\gamma^s$, where the cutoff γ^s is determined by*

$$\frac{1}{2}\left[(1+\beta)X_H-(\gamma^s+\beta)X_L\right]\theta^s(X_H)+\gamma^s X_L-c\left(\theta^s(X_H)\right)=rI.$$

Further, we have $\gamma^s<\gamma^u$ when monitoring cost c is sufficiently low and surplus split β is

sufficiently high.

In what follows, we assume there is another creditor who has a cheaper cost of capital but has no capacity to monitor (or verify others' monitoring activities). We investigate the optimal credit contract design that allows for maximum participation of a non-monitoring creditor in financing the project.

B. Multiple creditors where only one can monitor

The main focus of our analysis is on loan deals that involve the participation of creditors who never monitor (e.g., *institutional investors*). To this end, now suppose the creditor who is capable of monitoring only retains a fraction of total loan ownership and their monitoring activity is not verifiable. We will call this monitoring creditor the *bank*. Specifically, we assume that a loan contract specifies the fraction f_B of a loan that is contributed by the monitoring bank.

Crucially, although the bank only retains a fraction $f_B < 1$ of the loan ownership, it exclusively handles renegotiation with borrowers. In this regard, we make the following assumption on the renegotiation between creditors and borrowers when the monitoring creditor is only holding $f_B < 1$ fraction of the loan.

Assumption 1. Renegotiation with fractional ownership
The bank's ability to extract rents in renegotiation with borrowers is independent of the loan share f_B owned by herself.

This assumption captures the notion that while the salvage value recovered by the bank through monitoring is proportional to its share in loan ownership, the rent extraction payoff during renegotiation with the borrower is not as sensitive to the bank's ownership share. This suggests that the bank may be able to extract rents that cannot be verified and therefore not shared with the non-monitoring creditors. Under this assumption, the post negotiation payoff to the bank and the entrepreneur can be specified as

$$V_B = f_B\gamma X_L + \beta(X_H - X_L);\;\; V_E = (1-\gamma)X_L + (1-\beta)(X_H - X_L)$$

where the rent extraction from renegotiation – captured by parameter β – is independent of the share owned by the bank.[16] Accordingly, the payoff to the non-monitoring creditor

[16]In specifying the bank's payoff from renegotiation with the borrower, it is assumed that the bank negotiates on behalf of the non-monitoring creditors. Hence the total surplus gain from renegotiation is $X_H - X_L$, from which, a β fraction is extracted by the bank. Assumption 1 states that this fraction β is relatively insensitive to the share f_B owned by the bank – in the extreme, β is independent of f_B.

remains at $V_I = (1 - f_B)\gamma X_L$, given that no surplus from renegotiation will be shared with him.

Equilibrium monitoring effort. After the credit contract has been underwritten, the bank's optimal decision on her monitoring effort θ is then determined by

$$\max_{\theta} \theta \left(\frac{1}{2} f_B D + \frac{1}{2} V_B \right) + (1 - \theta) f_B \gamma X_L - c(\theta)$$

which hence implies

$$\frac{1}{2} \underbrace{f_B(D - \gamma X_L)}_{\text{salvage value recovery}} + \frac{1}{2} \underbrace{\beta(X_H - X_L)}_{\text{rent extraction}} = c'(\theta^B) \tag{5}$$

Denote the optimal monitoring effort θ satisfying the above Eq. (5) by $\theta^B \equiv \theta(f_B, D)$. Importantly, we have the following proposition relating the heterogeneous impact of renegotiation frictions on monitoring effort to the share of loans owned by the bank lender.

Proposition 2. *The sensitivity of monitoring effort θ to the rent extraction parameter β is higher when the bank is holding a smaller share in loan ownership, i.e.*

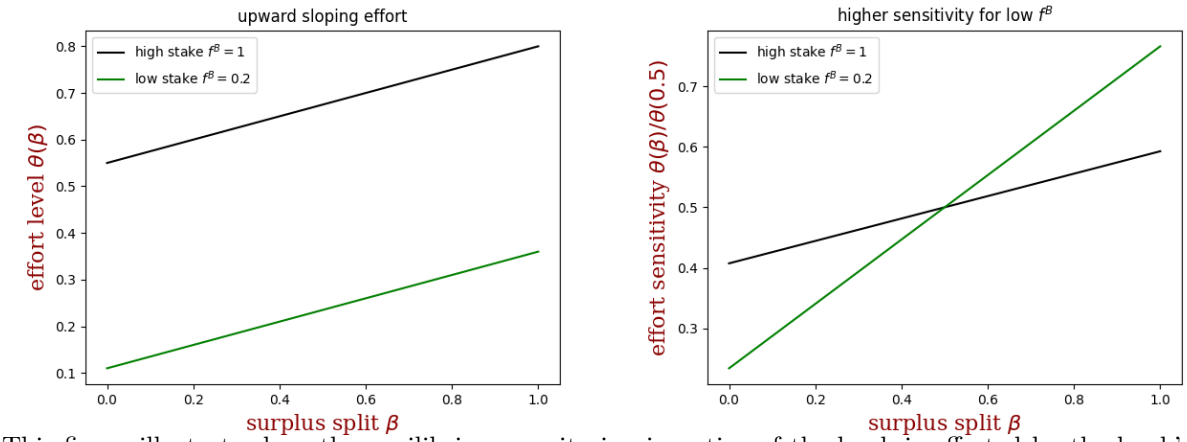
$$\frac{\partial \epsilon_{\theta,\beta}}{\partial f_B} < 0.$$

Intuitively, when the bank holds a small share of the loan, rent extraction through renegotiation plays a relatively larger role in providing monitoring incentives. Therefore, changes in renegotiation frictions that affect banks' rent extraction are likely to have a larger impact on the monitoring effort incurred by the bank in equilibrium, as illustrated in the right panel of Figure 1.

Contract design and institutional investors' participation. We are now ready to characterize the participation decision of the non-monitoring creditors, whom we refer to as *institutional investors*. In particular, we are interested in characterizing the maximum share of the loan that can be held by institutional investors, who rationally recognize that the equilibrium monitoring effort incurred by the bank lender decreases as the share owned by the bank is smaller. As such, in what follows in this section, we consider the contract design problem in which the objective is to maximize (minimize) the share $1 - f_B$ (f_B) held by institutional investors (bank) in the credit agreement.[17]

[17] One could rationalize this contract design specification by considering that institutional investors have a significantly lower cost of funding compared to the bank lender. Therefore, it is efficient to design a credit

Figure 1. Monitoring incentive and rent extraction in renegotiation



This figure illustrates how the equilibrium monitoring incentive of the bank is affected by the bank's rent extraction in renegotiation with borrowers. The left panel plots the monitoring effort θ as a function of bargaining parameter β; the right panel plots the sensitivity of equilibrium monitoring effort to changes in bargaining parameter.
Parameterization: $X_H = 1.5$, $X_L = 1$, $D = 1.5$, $\gamma = 0.4$, $c(\theta) = \theta^2$.

Recognizing the bank lender's monitoring effort choice $\theta(f_B, D)$, the participation condition for the institutional investor can be expressed as

$$\frac{1}{2}\theta(f_B, D)D + \left[1 - \frac{1}{2}\theta(f_B, D)\right]\gamma X_L \geq \tilde{r}I, \tag{6}$$

where the cost of funding $\tilde{r}$ of the institutional investor is lower than that of the bank lender r.

We define the minimum share of the loan that needs to be held by the bank lender who monitors by f_B^*.

Proposition 3. *The credit contract that maximizes the participation of institutional investors sets $D = X_H$, and the minimum share f_B^* held by the bank, which monitors, is determined by the following condition:*

$$\frac{1}{2}\theta(f_B^*, X_H)X_H + \left[1 - \frac{1}{2}\theta(f_B^*, X_H)\right]\gamma X_L = \tilde{r}I. \tag{7}$$

f_B^* satisfies $\frac{\partial f_B^*}{\partial \beta} < 0$.

The above expression characterizes the conditions under which renegotiation-based rent

contract that maximizes the participation of these creditors with cheaper funding sources, even though they may lack monitoring capabilities.

extraction can effectively serve as a substitute for the traditional skin in the game mechanism in providing sufficient monitoring incentives to banks. When the bank is better able to extract rents from renegotiation with the borrower due to reduced frictions in the renegotiation process (e.g., an increase in β), the bank can more easily and credibly convince the non-monitoring institutional investors that it will maintain sufficient monitoring effort even if its own stake is small. Furthermore, we have the following corollary stating how the minimum stake that the monitoring lender needs to hold is affected by the severity of the agency problem.

Corollary 1. *The minimum share that needs to be held by the monitoring creditor is lower for borrowers with less severe agency problems (higher γ), i.e., $\frac{\partial f_B^*}{\partial \gamma} < 0$.*

Revolver as incentive device for monitoring. One effective solution to provide incentives for a bank lender to incur higher monitoring efforts is to increase the rent that the bank can extract in the renegotiation process, typically by lowering the reservation value accrued to the entrepreneur when negotiations break down. Thus, in situations where banks issue a line of credit to the entrepreneur, one would expect the bank's threat of terminating the entrepreneur's access to any unused credit commitment to effectively strengthen their position in monitoring-triggered renegotiations. In other words, the bank's ability to revoke a revolving claim before maturity grants the bank greater credibility in monitoring efforts.

To formally illustrate this intuition, consider an alternate setting in which credit held by the monitoring creditor is all issued in the form of revolver credit facility. We assume that if the f_B fraction of the credit held by the bank is issued in the form of a revolver, the total payoff of the diverted project is $g(f_B)X_L$, where function $g(f_B) < 1$ and is decreasing in f_B. Intuitively, the lower payoff from the diverted project can be seen as a consequence of the borrower's precautionary motive to keep part of the revolver unused, and the bank's ability to revoke the borrower's access to any unused part of the revolver. For instance, suppose at the time of renegotiation, the borrower keeps an $\alpha > 0$ fraction of revolver unused (due to insuring motives), then a concrete functional form for $g(f_B)$ could be $g(f_B) = 1 - (1-\alpha)f_B$ as the borrower's access to the unused credit (the amount of which is $\alpha f_B \cdot I$), which is a decreasing function in f_B, may be revoked by the bank.

As such, the equilibrium monitoring effort θ chosen by a monitoring creditor who issues a revolver is determined by

$$\frac{1}{2}f_B(D - \gamma X_L) + \frac{1}{2}\beta\left[X_H - g(f_B)X_L\right] = c'(\theta^B) \tag{8}$$

Compared to the equilibrium monitoring effort from issuing a term loan as characterized

before, it is easy to show that

$$\theta^B_{revolver}(f_B, D) > \theta^B_{term}(f_B, D) \tag{9}$$

for any (f_B, D), where $\theta^B_{term}(f_B, D)$ and $\theta^B_{revolver}(f_B, D)$ are determined by Eq. (5) and Eq. (8) respectively.

Based on Eq. 9 and comparing the contract design with a revolving facility to that associated with term loan facility, we have the following corollary.

Corollary 2. *The credit contract can support a smaller stake f^*_B held by the bank when the bank issues a revolving credit facility, compared to contracts in which the bank issues a term loan.*

C. Implications and Hypotheses for Testing

Our model generates several testable hypotheses. This section summarizes the three main empirical predictions from the model, which are empirically tested in later analysis.

Hypothesis 1. *In the leveraged loan market, loan deals arranged with the split control structure in which bank lenders retain a small stake, are more likely to be associated with borrowers that are less subject to agency problems, or in situations where bank lenders are better able to extracts rents in their renegotiations with borrowers.*

Hypothesis 2. *A reduction in renegotiation frictions leads to a larger improvement in loan outcomes for deals in which banks hold smaller shares (split control deals) than those in which banks hold larger shares (non-split control deals).*

Hypothesis 3. *A reduction in renegotiation frictions has an impact on both the boundary and the contractual design in the leveraged loan market. In particular, it increases the likelihood that borrowers with severe agency problems obtain split control loan deals. Furthermore, it reduces banks' usage of revolving credit (for monitoring incentive provision), especially for split control deals.*

3 Data and Sample Construction

3.1 Deal and Firm Information

Loan Contracts. We collect data on loan contracts from Loan Pricing Corporation (LPC) DealScan. The DealScan database has extensive and reliable information on loan pricing, contractual terms, and conditions. DealScan provides deal and tranche level information, lender composition, and borrower information. We use this dataset to identify split control deals as leveraged loan deals consisting of cov-lite term loan tranches and a non-cov-lite revolving credit tranche. We restrict our sample between 2005 and 2018.

Bank Balance Sheet. We obtain bank balance sheet and income statement information from the Reports of Condition and Income (Call Reports). This data is reported by the Federal Reserve Bank of Chicago and is regulated by the Federal Reserve System, Federal Deposit Insurance Corporation (FDIC), and the Comptroller of the Currency. The data is reported at annual frequency, variables we are interested include tier-1 capital, assets, interest income, non-interest income, ROA, leverage, and loan-to-deposit ratio. We merge this data with our deal-level data to study how lender characteristics affect bank participation in split control deals. The summary statistics of banks by split control deals participation is reported in Table A.4.

Covenants. We extract data on loan covenants from Thomson Reuters SDC Platinum. SDC provides information on new issues, M&A, syndicated loans, private equity, project finance, and poison pills, among other financial transactions. We focus on data on syndicated loans and examine covenant features for the deals in our sample. The data is reported at annual frequency for new deals, the variable of interest include: whether the deal has a covenant, whether the deal was renegotiated, the rounds of renegotiation, whether the deal was amended, the details of covenants. For the details of covenants, we extract the text of financial covenants and categorize them into *Debt-to-Ebitda*, *Interest-coverage ratio*, *Fixed-charge coverage*, *Debt-Issuance*, and *Other*. We record the value of the financial covenants if it's recorded in the SDC database.[18] We merge this data with our deal-level data to compare covenant features in split control and non-split control deals, before and after the tax policy.

[18]SDC provides the details of financial covenant category incorporated, the value of each financial covenant, and whether a given financial covenant changed within the duration of the loan deal. An inspection of the data shows that only if a financial covenant was modified or amended, it will show up several times and each time will have a different value associated with it. Based on this logic, we construct the rounds of renegotiation by counting the maximum number of times any financial covenant shows up multiple times in SDC.

Firm outcomes. We track firm outcomes using Compustat data provided through S&P Global Market Intelligence. Compustat provides standardized financial statement and market data for publicly traded companies. This includes data on firm fundamentals from balance sheets, statements of cash flows, income statements, and supplemental data outcomes. We use the Compustat at annual frequency, the variables of interests include size, age, profitability, sales, net debt issuance, R&D expenditures, capital expenditures, etc. We merge this data with our deal-level data to compare characteristics of split control borrowers to non-split control borrowers. Summary statistics of split control borrowers and non-split control borrower are reported in Table A.1.

3.2 Data Collection on Loan Renegotiation and Monitoring

In this section, we explain in detail how we collect information and construct variables related to loan renegotiation terms and the lenders' monitoring commitment from SEC filings. We conduct keyword search using the SEC API.[19] To better make queries on SEC API, we restrict our sample to firms with Ticker symbol, which results in a total of 4,228 companies. We collected the data and augment all the negotiation outcomes at annual frequency.

Construction of loan renegotiation information. We obtain information for loan renegotiation outcomes from the renegotiation files supplemented to the 10-Q and 10-K filings. In 10-K filings, "Item 15: Exhibits, Financial Statement Schedules" display all the related files about the companies' financial statements and changes to the companies' agreements including credit agreements.[20] We restrict our attention to changes in *credit agreements* between a company and its bank lenders. This is done through confining the search of documents to exhibits with titles of format "XX-th Amended and Restated Credit Agreement." [21] We collect all the credit amendment files shown as exhibits in 10-K and 10-Q filings during 2005 and 2018 for companies in our data set and conduct the relevant text searches.

Within each of the amendment documents, we collect the ticker of the filing company, the credit agreement initiation date, and the agent bank of the credit agreement to match with our sample of deals. To identify accelerated repayments, we search for indicators such as "accelerated maturity," "accelerated repayment," and the co-occurrence of "acceleration"

[19]The SEC API provides platform to search and extract information of all the filings by publicly listed companies.

[20]For 10-Q filings, "Item 6: Exhibits" demonstrate the corresponding financial statements and changes in all kinds of agreements.

[21]For instance, Urban Outfitters incorporated its sixth amended and restated credit agreements in its 10-Q report in July of 2012, and in "Item 6 Exhibits" of that 10-Q filing, the firm demonstrated the "Sixth Amended and Restated Credit Agreement" for its loan contract with a group of syndicated lenders with Wachovia Bank as the administrative agents.

or "accelerated" with "repayment" or "maturity" in the text. To detect the initiation of amendment fees, we look for the occurrence of "amendment fee," "extension fee," and "monitoring fee." We also require that the keywords for fees appear together with "administrative agents" and "agent banks" in the same paragraph to confirm that the fees are paid only towards agent lenders. For the inclusion of extra covenants, we search for phrases like "inserting in Section XXX" and "XXX is modified by adding the following paragraph" and require that the added paragraph contains specific financial covenants. To identify interest rate increases, we search for the co-occurrence of "LIBOR" and "increases" or "lifted" in the same paragraph. To detect demands for extra borrowing base or collateral, we look for keywords such as "borrowing base," "collateral," and "extra," or "in excess of." For reductions in the borrowing amount, we search for the co-occurrence of "revolver amount" or "revolver credit line amount" and "decreased." We locate 770 credit renegotiation and amendment documents filed as exhibits in 10-Q and 1,853 files in 10-K for companies with tickers in our sample.

Construction of monitoring commitment in loan contracts. To better measure lenders' monitoring intensity or monitoring commitment, we conduct keyword searches in the original credit agreements.

When a company enters into new credit agreement or renews an existing credit agreement, they are required to file for "Item 1.01 Entry into a Material Definitive Agreement" in their 8-K filings.[22] The original agreement of the newly entered facility was appended to the exhibits of that 8-K. For all the companies with tickers in our sample, we collect all the exhibits associated 8-K filings during 2005 and 2018 that are original credit agreements. We further collect the date when the new credit agreement was signed as well as the lead bank associated with the deal, which enables us to match with our deal data set.

To measure lenders' monitoring incentive and monitoring commitment, following Gustafson et al. (2021), we extract information and construct three variables from the credit agreement files. First, we record the occurrence of financial statement reporting requirement in the credit agreement by searching keywords "financial statement," "income statement," "delivery," "submission." Second, we record whether there are field examinations, inspections and appraisals of collateral by searching keywords "field exam," "inspections," "asset appraisal," and "collateral appraisal." Finally, we record the frequency of financial statement or income statement delivery by recording the occurrence of keywords "monthly," "quarterly," "semi-annually," and "annually." If the frequency is monthly, we represent the frequency by 1

[22]For instance, in the 8-K form filed by CME Group Inc in January of 2011, "Item 1.01 Entry into a Material Definitive Agreement" documented the initiation of a $1 billion multi-currency revolving senior credit facility credit agreement between the company and a syndicate of lenders, with Bank of America as the agent bank.

month, and if the frequency if quarterly, we code it as 3 months, and so on and so forth. We located a total of 282 credit agreement files. Among 282 credit agreements, 85 out of the 282 credit agreements mention monitoring frequency, and the average monitoring frequency associated with these agreements is 5.82 months.[23]

4 Corporate Lending with Non-Monitoring Creditors

This section describes the evolution of corporate lending as institutional investors' participation increases. We begin by providing detailed context for the leveraged loan market and discussing how the increased participation of institutional investors in this market has been linked to the rise of cov-lite loans and split control deals. We then conduct a thorough empirical analysis, comparing the contractual design differences between split and non-split control deals, and relate these empirical patterns to our conceptual framework on creditor monitoring.

4.1 Institutional Investors in the Leveraged Loan Market

The literature on banking and contract theory has primarily examined lenders' incentives of conducting costly monitoring on their borrowers. While monitoring by banks is critical and socially beneficial, particularly when borrowers face severe agency problems, banks' monitoring incentives are ambiguous when banks have relatively small stakes in the loans they originate. This incentive issue of conducting costly yet valuable monitoring is akin to the widely debated concerns about the incentives of loan originators to screen borrowers properly when they subsequently sell their originated loans through securitization (e.g., Drucker and Puri (2009); Blickle et al. (2020)). Therefore, our study aims to investigate how banks' lower loan retention or "skin in the game" affects their equilibrium monitoring behavior, as well as the resulting impact on the contractual features of loans before origination and the performance of loans after origination.

We investigate this research objective in the context of syndicated lending. While banks are typically viewed as lenders who intensively screen and monitor borrowers, institutional investors are often regarded as passive lenders with limited screening and monitoring capabilities (Gustafson et al. (2021)). The syndicated loan market, which traditionally involves active participation of both banks and institutional investors, provides us with an ideal laboratory to study the impact of the presence of non-monitoring creditors in corporate lending.

[23]The relatively lower monitoring frequency in our sample is likely driven by the fact that our sample does not have incidences of daily and weekly monitoring.

Our focus is on the leveraged segment of the syndicated loan market, for which proper monitoring by creditors is important as these borrowers are particularly subject to greater agency problems.[24]

One of the most prominent features of the leveraged loan market is that non-bank institutional investors have significantly increased their participation in this particular segment of the lending market since 2000. This group includes finance companies, insurance companies, hedge funds, distressed debt funds, loan mutual funds, and collateralized loan obligations (CLOs). According to the IMF, the fraction of loans held by non-bank institutional investors in the leveraged loan market increased from around 30% in 2001 to more than 80% in 2018. Meanwhile, the fraction of loans held by banks declined from ∼50% in 2001 to less than 10% in 2018.[25]

A recent literature has attributed the growing participation of non-bank institutional investors in the leveraged loan market to reach for yield behavior when interest rates are low (e.g., Becker and Ivashina (2016), Goel (2018)), higher regulatory requirements (e.g., Loumioti (2019)), and stricter securitization standards faced by banks after the financial crisis (e.g., Irani et al. (2020), Kundu (2022)). Figure 2 shows the aggregate trends of institutional lenders' participation in the leveraged loan market and the time trend of split control deals (explained in the next section) in the leveraged loan market. Indeed, a drastic increase has been witnessed during the post crisis period, which features a low interest rate and more stringent regulation on bank assets.

4.2 Split Control Deals in the Leveraged Loan Market

The growing participation of institutional investors in the leveraged loan market, and the concomitant shrinking share held by bank lenders has resulted in structural changes in the design of loan contracts. Following the entry of institutional investors into the leveraged loan market, split control arrangements have evolved as a unique type of contractual design.

Recent papers have documented the evolution of loan contracts in the leveraged loan market. Becker and Ivashina (2016) document that the surge of cov-lite deals has co-moved with the inflow of institutional investors in the leveraged loan market.[26] Berlin et al. (2020)

[24]The leveraged loan market refers to a specific syndicated loan segment where loans are primarily made to relatively risky borrowers. Loan Pricing Corporation (LPC) defines a leveraged loan as a syndicated loan that is rated BB+ or lower or an unrated loan with an interest rate spread larger than 150 basis points. We follow the definition given by LPC. We refer readers to Kundu (2022) for more details on the classification of leveraged loans.

[25]The data is available at the 2019 Global Financial Stability Report.

[26]Cov-lite loans emerged to accommodate the contractual flexibility required by institutional investors as renegotiation frictions increased due to the inflow of institutional investors.

examine the growth of cov-lite loans and document that the cov-lite loans are almost always paired with revolving lines of credit, retained by banks, which contain the traditional financial covenants.[27] The split structure gives bank lenders the exclusive right and ability to monitor and renegotiate financial covenants. We follow Berlin et al. (2020) in our designation of split control deals. Specifically, we define a deal package in the leveraged loan market as a split control deal if this deal has cov-lite term loan tranches and a non-cov-lite revovling credit tranche. In other words, we refer to deals as split control deals if the financial covenants only apply to a subset of tranches and can be waived or modified only by a subset of lenders.

Split control deals and banks' skin in the game. Table 1 shows the characteristics of split control and non-split control deals. As exhibited by the table, split control deals have significantly lower bank share (22%) compared with non-split control deals (71%), more lenders involved in the deal package (5.2 lenders) compared with non-split control deals (4.74 lenders), longer maturity (5.85 years) compared with non-split control deals (4.37 years), higher loan spread (406.67 bps) compared with non-split control deals (347.17 bps), and larger total loan volume ($621.99 million) compared with non-split control deals ($179.01). These comparisons are consistent with the findings of Berlin et al. (2020).

Recall that a main implication of conceptual framework is that when banks hold smaller loan shares, the provision of monitoring incentives relies more heavily on the renegotiation-based channel, which serves as a substitute to the stake-based channel. In our subsequent analysis, a key empirical test thus involves the comparisons between loan deals associated with different levels of banks' stake in the loan. To this end, we use split control status as a proxy for bank skin in the game.

We validate this proxy by examining the within-bank retention of term loans and revolving lines of credit. Banks retain a significantly smaller share of their loan originations in split control deals compared to non-split control deals. The first row of Table 1 shows the comparison of banks' "skin in the game" for split control and non-split control deals. The average bank commitment share in the split control deals is 22%, while for non-split control deals, the average bank commitment is 71%. Hence, the difference in bank retention between split control and non-split control deals validates our use of split control status as a proxy for low skin in the game.

Differences between split and non-split control deals. We further examine the differences between split control and non-split control deals by borrower characteristics, industry, secured status, loan purpose, private equity sponsorship, and lender characteristics, which

[27]Banks typically retain the revolving lines of credit, while the cov-lite term loans are typically held by non-bank institutional investors.

we relate to our conceptual framework where the monitoring lender only takes partial stake in the loan.

On the borrowers' characteristics, we find that split control borrowers are older, larger, more productive and profitable relative to non-split control borrowers. Further, split control borrowers are more likely to operate in industries with higher intangibles. On the contracting characteristics, we find that split control deals are more likely to be secured and are used towards private equity activity relative to non-split control deals.[28] On the lenders' characteristics, we find that well-capitalized, profitable banks with stronger lending relationships are more likely to participate in split control deals. Detailed descriptions of these findings are provided in Appendix B.

Overall, our findings suggest that split control (low bank share f_B) deals are more likely to be associated with borrowers that are less prone to agency conflicts (e.g., more creditworthy borrowers, credit disciplined by private equity sponsors), or for whom the incentive provision for bank monitoring relies more on the renegotiation-based rent extraction channel than the salvage value recovery channel (e.g., borrowers operate in intangible industry with limited fixed assets, secured loans, banks have strong bargaining position due to relationship with borrower, etc.). These findings are consistent with our conceptual framework in Section 2, which predicts that credit contracts with small stakes held by the monitoring creditor can be underwritten if the severity of agency frictions are sufficiently low (e.g., high γ), or, if the rent extraction channel is strong enough to serve as a substitute to the stake-based channel in providing monitoring incentives (e.g., high β).

5 Identifying the Renegotiation Channel: An Event-Based Analysis

Many theoretical studies in the incomplete contracting literature have recognized and analyzed the importance of ex post renegotiation on the ex ante contract design.[29] One key

[28]This is in line with existing research that highlights how buyouts and private equity participation can mitigate agency problems, enhance firm value through managerial discipline, and improve operational efficiency (e.g., Jensen and Meckling (1976); Jensen (1986); Lehn and Poulsen (1989); Kaplan (1989); Smith (1990); Innes (1990); Muscarella and Vetsuypens (1990); Cotter and Peck (2001)). Specifically, Badoer et al. (2021) argues that the reputational capital of private equity sponsors can serve as a substitute for maintenance covenants and mitigate agency costs.

[29]The impact of ex post renegotiation on ex ante contract design has been acknowledged since the earliest seminal works on the allocation of control rights in credit contracts, including Aghion and Bolton (1992), Dewatripont and Tirole (1994), and Berglöf and Von Thadden (1994). Later, theoretical work such as Bolton and Scharfstein (1996), Hart and Moore (1998b) and Garleanu and Zwiebel (2009) explicitly model the possibility of and friction in renegotiation between creditors and borrowers, and study their implications

objective of this paper is to empirically identify the following channel: renegotiation-based rent extraction provides incentives to monitor, which supports the underwriting of credit agreements in which monitoring creditors hold smaller stake.

Empirical identification of this channel is challenging due to difficulties in constructing exogenous shifters that solely affect creditors' incentives to conduct monitoring via the renegotiation channel without impacting the severity of the underlying agency problem. To be more precise, a clean empirical identification would require shifters that do not affect the necessity of monitoring.[30]

In this section, we conduct an event-based analysis to empirically identify the impact of a policy-induced change that affects creditor-borrower renegotiation on both the ex ante contracting and the ex post loan outcomes in the leveraged loan market. This empirical design exploits the exogenous variation in creditors' net payoff from (cost in) renegotiation to test key predictions from our theoretical analysis in Section 2 and understand how banks' monitoring incentives as well as credit contracts in leveraged loan markets are causally affected by changes in renegotiation environments.

5.1 Background of TD9599 and Empirical Design

Our empirical analysis exploits the passage of TD9599 in 2012, a tax policy that altered the taxes owed on publicly traded debt. When debt is modified outside of bankruptcy proceedings, the restructuring is treated as a taxable exchange. Modifications may include changes in the issue's principal, maturity, timing of interest payments, yield, or recourse status (Campello et al. (2018)). The amount of taxes owed by the original lenders depends on the IRS' classification of the debt as public versus private. For privately traded debt, taxes are based on the difference between the *par value* of the newly-renegotiated debt contract and the debt's original par value. Generally, the par value of out-of-court renegotiated debt is equivalent to the original par value, thus, while debt holders may experience a capital loss from restructuring privately traded debt, they cannot claim tax credits (Asquith et al. (1994); Demiroglu and James (2015); Campello et al. (2018)). In contrast, for publicly traded debt, taxes are based on the difference between the *market value* of the newly-renegotiated debt contract and the debt's original par value. Debtholders can thus receive a tax credit from restructuring publicly traded debt as the market value is generally below the par value. Hence, the renegotiation payoff (costs) associated with publicly trade debt are higher (lower) for creditors than that associated with privately traded debt.

on the optimal design of credit contracts.

[30] Otherwise, any observed impact on ex ante contracting cannot be solely attributed to lenders' credibility in committing to costly monitoring activities.

TD9599 changed the classification of private and publicly traded debt on September 13, 2012. Prior to the passage of TD9599, debt was classified as publicly traded according to three conditions of a 1994 regulation: (i) The issue was exchange listed or market traded property; (ii) the issuance value appeared in a quotation medium; or (iii) the issuance value is quotable property in the 60-day period ending 30 days after the issue date of the debt instrument. TD9599 added a fourth condition that debt would be classified as public if a "soft quote" could be obtained from one broker, dealer, or pricing service – a condition satisfied by most syndicated loans (Campello et al. (2018)).

One potential concern is that TD9599 may be endogenous to bank monitoring and its associated effects in the leveraged loan market. We argue that TD9599 was a plausibly exogenous event that occurred outside of the leveraged loan market. The announcement of TD9599 was unanticipated and the scope of the regulation was uncertain. The IRS drafted TD9599 in response to a request from the US Treasury to review the tax definition of public debt, which had not changed since 1994. The IRS released an initial proposal on January 6^{th}, 2011 for public comment. According to the IRS web page, none of the comments cited renegotiation or enhancement of bank monitoring as a motive for the change.[31] In fact, the IRS did not specify which debt contracts would be subject to TD9599, nor did they provide a timeline for its adoption. Hence, the policy was unforeseen by market participants. Moreover, the discard rate for IRS proposals is as high as $\frac{1}{3}$ and the IRS ranks as the second highest among U.S. administrative agencies for the length of time spent on drafting new documents (Yackee and Yackee (2016); Campello et al. (2018)). As the final approval and adoption was uncertain, the passage of TD9599 provides a plausibly exogenous natural experiment to study how a reduction in renegotiation costs affects bank and borrower outcomes. As an aside, our analysis in Section 5.4 focuses on the outcomes of loan deals issued well before the tax policy was implemented. As such, the extent of selection bias in this analysis is limited.

The new designation of syndicated loans as publicly traded debt has been shown to dramatically reduce "renegotiation frictions" and increase lenders' willingness to renegotiate loans, according to previous studies. Campello et al. (2018) document the significant drop in CDS spreads among distressed firms relying on syndicated loan financing after the passage of TD9599. Ferracuti and Morris (2017) document that since the launch of TD9599, the maturities of syndicated loan contracts originated in the US have lengthened with fewer performance pricing provisions, indicating that lenders' willingness to renegotiate improved after TD9599. In our investigation of the ex-post renegotiation of credit agreements, discussed in detail in Section 5.2, we find evidence that after TD9599, agent banks are more likely to decrease the size of revolving credit facilities during renegotiation, as predicted

[31] See IRS TD 9599.

in Corollary 2. This finding is consistent with TD9599, which provides lenders with a tax subsidy for restructured debt, thereby increasing the incentives for banks to monitor and bargain with borrowers.

In the subsections that follow, we begin by examining how the outcomes of renegotiations and creditors' monitoring activities that trigger those renegotiations are impacted by this plausibly exogenous tax policy (Section 5.2). We then investigate the policy impact on both the ex ante design of credit contracts (Section 5.3) and the ex post performance of outstanding loan deals (Section 5.4) in the leveraged loan market. In particular, we are interested in how such policy impact potentially differs for loan deals associated with small (high) bank share, as proxied by split (non-split) control deals.

5.2 Policy Impact on Renegotiation and Creditor Monitoring

To empirically identify the renegotiation-based channel in incentive provision, which we propose as a substitute to the stake-based channel, we need to first construct variation in creditors' (expected) payoffs from their renegotiations with borrowers. To this end, we investigate the policy impact on renegotiation outcomes and creditor monitoring.

Impact on renegotiation outcomes. We begin by directly examining renegotiation outcomes for split and non-split control deals around the tax policy. A key tenet of our paper is that the renegotiation-based rent extraction serves as a substitute for the stake-based mechanism in providing monitoring incentives, hence, loan deals in which monitoring creditors take smaller shares are more susceptible to changes in the renegotiation environment. To this end, we study how the passage of the tax policy differentially affects renegotiation outcomes for split and non-split control deals.

To achieve this goal, we extract information related to loan renegotiation outcomes and lender outcomes from the credit amendment files that supplement 10-Q filings. In particular, we look at whether banks are more likely to accelerate repayment, charge amendment fees, include extra covenants, increase interest rate and demand extra borrowing base. The regression specification is as follows:

$$\text{Outcome}_{d,s,t} = \gamma_{s,t} + \beta \times \text{Split Control}_{d,t} \times \mathbb{1}[\text{Post}]_t + \beta_1 \times \text{Split Control}_{d,t} + \epsilon_{d,s,t} \quad (10)$$

The left-hand side variable is the renegotiation outcome variable, s indicates the two-digit industry of the borrower that issued the deal, t represents the year during which the deal was issued. On the right-hand side, the main explanatory variable is the dummy variable $\text{Split Control}_{d,t}$ which is equal to 1 if the deal d issued in year t is a split control deal.

$\mathbb{1}[\text{Post}]_t$ is a dummy variable that equals to 1 if year t is after the passage of TD9599. We use a within industry-year estimator across all specifications. Industry×year fixed effects are captures by $\gamma_{s,t}$.

Table 2 presents the results of our regression analysis, which provide direct evidence supporting renegotiation-based rent-extraction. Consistent with our model and prior research on creditor coordination (e.g., Bolton and Scharfstein (1996)), split control deals are more likely to rely on renegotiation prior to the tax policy, as indicated by the coefficient associated with *Split Control*. After the tax policy, we find that agent banks in split control deals are more likely to use renegotiation to accelerate borrower repayments, increase interest rates, demand extra borrowing base provision, include extra covenants in the loans, charge extra amendment fees, and reduce the revolver credit line's limit compared to agent banks in non-split control deals.

To be more specific, after the tax policy, compared to non-split control deals' agent banks, split control deals' agent banks are 3.3 percentage points more likely to accelerate borrower repayments (0.47 standard deviations), 3.3 percentage points more likely to increase interest rates (0.42 standard deviations), 3.0 percentage points more likely to demand extra borrowing base provision (0.40 standard deviations), 1.5 percentage points more likely to include extra covenants in the loans (0.48 standard deviations), 0.84 percentage points more likely to charge extra amendment fees (0.43 standard deviations), and 9.6 percentage points more likely to reduce the borrower's borrowing limit in the revolving credit line tranche (0.035 standard deviation). Thus, a reduction in renegotiation frictions directly enhances the value of banks' claims through renegotiation, especially for split control deals in which banks' skin in the game is lower. These findings support our proposed theoretical mechanism which suggests that in loan deals where monitoring creditors' skin in the game is lower (e.g., split control deals), the provision of incentives for monitoring relies more on renegotiation-based rent extractions and is, therefore, more sensitive to changes in renegotiation frictions.

Impact on creditor monitoring. While our results indicate that an exogenous reduction in renegotiation costs is associated with greater payoffs during renegotiation for split control deals compared with non-split control deals after the tax policy, it is unclear whether these creditor-favorable outcomes are triggered by or induce changes in banks' incentives to monitor borrowers. We directly examine changes in banks' monitoring intensity and commitment around the tax policy in investigating the bank monitoring channel. To gauge monitoring intensity, we extract information from the original credit agreements filed under the 8-K. Following Gustafson et al. (2021), we construct three measures of lenders' monitoring intensity. The first is an dummy variable indicating whether the credit agreement requires firms to deliver a financial statement, the second is an dummy variable indicating whether

the lenders conduct a field exam by visiting the borrowing firm on-site, and the third is the frequency of financial statement submissions as measured by the number of months.

Table 3 presents the results of this analysis. Before the tax policy, split control deals are less likely than non-split control deals to require firms to deliver financial statements periodically and to have on-site field exams/inspections. In addition, these firms submitted financial statements less frequently than their non-split counterparts. However, after the tax policy, split control deals are 1.5 percentage points more likely to require periodic financial statement deliveries (0.25 standard deviations) and 7.12 percentage points more likely to have field exam requests (0.46 standard deviations) than non-split control deals. Furthermore, the frequency of financial statement deliveries increased by about one quarter for split control deals after the tax policy. Thus, our findings suggest that banks increase their monitoring activities after the tax policy, especially for split control deals.

5.3 Impact on Loan Contracting

Thus far, our analysis has shown that the tax policy led to more significant (creditor-favoring) changes in renegotiation outcomes and increased creditor monitoring in loans with smaller bank shares (i.e., split-control deals). In this section, we aim to analyze the impact of the policy on the initial design of credit contracts in the leveraged loan market. To this end, we compare loan deals issued before and after the implementation of the tax policy to understand how it influenced credit contracting.

5.3.1 Trend of Loan Contracting Features in Leveraged Loan Market

To investigate how the tax policy affected credit contracting in the leveraged loan market, we start by presenting a series of graphical illustrations. These visualizations help us to understand how the contracting features of loan deals evolve over time, with a particular focus on the period around the year in which the tax policy was implemented.

Figure 3 depicts the time trend of the average number of covenants in a deal and the average number of rounds of renegotiation after deal origination for both split and non-split control deals. Prior to 2012, there were negligible differences in the number of covenants between split and non-split control deals during loan origination. The difference in the number of covenants between split and non-split control deals was less than 0.1. However, after the passage of TD9599, the number of covenants associated with split control deals increased dramatically from 0.2 to more than 1.1, whereas the number of covenants in non-split control deals increased from 0.2 to 0.5 over the same period.

Moreover, prior to TD9599, both split and non-split control deals had an average of around 2.0 to 2.5 rounds of renegotiation. However, following the implementation of TD9599, this disparity widened. Specifically, split control deals experienced a substantial rise, averaging at 3.5 rounds of renegotiation one year later. In contrast, the number of rounds of renegotiation for non-split control deals hovered around 2.5. Thus, it is evident that split control deals experienced a significantly higher number of renegotiation rounds compared to non-split control deals after the activation of TD9599.

Figure 4 illustrates the time trend of the incidence of various types of covenants for split and non-split control deals. We examine how the incidence of debt-to-ebitda, fixed charge coverage ratio, debt issuance, interest coverage ratio, and other types of covenants changes over time. Before the tax policy modification, both split and non-split control deals exhibited comparable frequencies of debt-to-ebitda covenants, with approximately 20% of both types of deals having at least one covenant restricting the firms' debt-to-ebitda ratio.However, following the implementation of the tax policy, there was a notable surge in the inclusion of debt-to-ebitda covenants specifically for split control deals. Presently, 60% of split control deals encompass such a covenant, whereas non-split control deals only display a 20% inclusion rate. Similar patterns of increased covenant inclusion for split control deals in comparison to non-split control deals are observed for fixed charge coverage ratio, debt issuance, interest coverage ratio, and other covenant types.[32]

One may be concerned that there are other split-control institutional specific confounding factors or policies other than banks' skin in the game that drive the observed differences between split control and non-split control deals. To address this concern, we narrow our attention to non-split control deals and examine the evolution of bank loan retention before and after the tax policy. Figure A.7 presents the average bank share in non-split control deals, with the red line indicating the activation of TD9599. It is evident that post TD9599, for non-split control deals the average bank presence declined from about 70% to 30%, indicating that the tax policy significantly reduced the necessity for agent banks to hold large skin in the game for non-split control deals as well.

5.3.2 Regression Analysis

This section investigates the impact of the tax policy on the contractual features of loan deals issued to leveraged borrowers to codify the findings presented in Section 5.3.1. Specifically, our analysis aims to understand how changes in banks' monitoring incentives,

[32]"Other types of covenants" refers to all the other covenants that are not Debt-to-Ebitda, Interest coverage, Fixed charge coverage or Debt issuance. Some typical examples include extra collateral provision, restrictions on sales of assets, restrictions on changes in management team, etc.

resulting from the reduction of renegotiation frictions, translate into contractual outcomes in the leveraged loan market.

Our baseline regression specification is the following:

$$\mathrm{Y}_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_{d,t} + \beta_1 \times \mathbb{1}[\text{Split control}]_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,s,t} + \epsilon_{d,s,t}.$$

Y indicates the outcome variable – this includes indicators of covenant inclusion, rounds of amendment/renegotiation, covenant tightness, as well as other contract features including fees, deal purpose, rating, and share of revolving lines of credit. where s indicates the two-digit industry of the borrower that issued the deal, t represents the year during which the deal was issued. X denotes deal level controls include deal size and maturity.

Covenant inclusion. Our analysis begins with examining an important dimension in the ex-ante design of contracts: covenants in credit agreements. Specifically, we study the heterogeneous effects of the tax policy on salient features of covenants, such as inclusion and tightness, around the tax policy. With the notion that covenants serve as contractual devices that enhance banks' incentives to monitor, our empirical investigation aims to determine how covenant-based monitoring is differentially affected for deals with high and low skin in the game around the policy.[33] We posit that (Hypothesis 3) split control deals are more likely to feature covenants relative to non-split control deals after the tax policy following an exogenous reduction in renegotiation frictions.

Table 4 presents these results. In column 1, we find that after the activation of TD9599, split control deals are 2.04 percentage points more likely to include covenants relative to non-split control deals. This corresponds to an additional 0.1 standard deviations rise in covenant inclusion. Furthermore, as indicated in column 2, the average number of covenants in split control deals increases by an additional 1.05 compared to non-split control deals after the tax policy, representing an additional 0.42 standard deviations increase. Aside from the number of covenants, we find evidence of heightened creditor intervention in split control deals following the tax policy. Columns 3 and 4 demonstrate that split control deals are 12.4 percentage points more likely to undergo at least one renegotiation and amendment during the loan contract period compared to non-split control deals. This corresponds to an additional increase of 0.32 standard deviations. Moreover, split control deals experience an additional 0.63 rounds of renegotiation in comparison to non-split control deals after the tax policy, amounting to 0.48 standard deviations, as depicted in column 5.

We establish the robustness of these results by including deal controls in columns 5-8.

[33] Covenants give banks the ability to renegotiate or call loans when covenants are violated, enhancing the flexibility and efficiency of contracting (Rajan and Winton (1995)).

Additionally, Figure 5 presents the time-varying regression coefficients on the interaction between the split control indicator and the year dummy between 2009 and 2015. Consistent with our regression findings, we observe that split control deals exhibit more substantial responses in terms of covenant inclusion and renegotiation during the post-2012 periods when compared to non-split control deals.

We further examine which specific covenants banks rely on more for monitoring when renegotiation costs are reduced (Rajan and Winton (1995)). In Table 5, we examine how the inclusion of debt-to-ebitda, interest coverage ratio, fixed charge coverage ratio, debt issuance and other types of covenants changes for split and non-split control deals around the tax policy. The outcome variables are indicators that reflect whether there are covenants that restrict a firm's debt-to-ebitda, interest coverage, fixed charge coverage, debt issuance, or other measures, respectively.

We find that there is a pecking order to the inclusion of covenants. In particular, we find in column 1, after the tax policy, the debt-to-ebitda ratio covenant is 20 percentage points (0.46 standard deviations) more likely to be included in split control deals compared with non-split control deals. This estimate is larger than the point estimates associated with the interest coverage ratio covenant, debt-issuance covenant, and fixed charge coverage ratio covenants, which are 6.25 (0.13 standard deviations), 2.8 percentage points (0.06 standard deviations), and 1.2 percentage points (0.05 standard deviations) more likely to be included in split control deals compared with non-split control deals after the tax policy, as shown in columns 2-4, respectively. Other types of covenants are 8.5 percentage points (0.19 standard deviations) more likely to be included in split control deals, as indicated in column 5. We show that these results are robust to the inclusion of deal controls in columns 5-8. Hence, our findings suggest that when renegotiation costs are reduced, banks are incentivized to conduct covenant-based monitoring using debt-to-ebitda ratio covenants followed by interest coverage ratio, debt-issuance, and fixed charge ratio covenants.

Covenant tightness. Thus far, our results indicate a more pronounced increase in that covenant inclusion among split control deals after the tax policy. This suggests a heightened emphasis on covenant-based monitoring after the tax policy, particularly on the extensive margin. However, it remains to be examined whether there are concurrent changes in covenant tightness on the intensive margin. An intensification of covenant tightness could also indicate a greater proclivity to renegotiate.

Table 6 presents the differences in covenant tightness between split and non-split control deals, around the tax policy. We find that prior to the tax policy, split control deals do not exhibit any statistically distinguishable difference in covenant tightness relative to non-split control deals. However, after the tax policy, split control deals experience a tightening of

their debt-to-ebitda, interest coverage, and fixed charge covenants. Specifically, we find that split control deals require borrowers to maintain a 0.083 extra higher debt-to-ebitda ratios compared to non-split control deals after the tax policy, representing an 18% tightening relative to the pre-event average level. Moreover, split control deals require borrowers to maintain 0.230 extra higher interest coverage ratios (8.5% extra tightening), and 0.067 extra higher fixed charge coverage ratios (2.5% extra tightening), compared to non-split control deals, after the tax policy.

Furthermore, following Murfin (2012), we construct measurement of covenant tightness and examine how covenant tightness varies for split and non-split control deals around the tax policy.[34] Our findings suggest that following the passage of the tax policy, split control deals experienced 0.056 higher covenant strictness (7.6% extra tightening) compared with non-split control deals. Murfin (2012) suggests a positive correlation between covenant strictness and firms' ex-post covenant violations. Consistent this, our findings demonstrate that split control deals exhibit significantly tighter covenants, more frequent rounds of amendment and renegotiation after the tax policy, as shown in Figure 4.

Fees. Credit contracts in corporate lending often involve fee payments. This section examines the impact of the tax policy on the presence and magnitude of different types of fees in loan deals issued to leveraged borrowers. Specifically, we investigate upfront fees and annual fees. An upfront fee refers to a one-time payment collected upon the closing of the deal, while an annual fee represents an annual charge calculated based on the entire commitment amount.

We hypothesize that when renegotiation cost (payoff) is relatively low (high), banks demand lower compensation ex ante in the form of fees. This hypothesis is in the spirit of Williamson (1983) who argues that advance payments are equivalent of posting a "hostage" or a credible commitment that prevents parties from opportunistically changing contract terms during renegotiation. Consequently, we posit that the tax policy results in a decrease in advance fee payments, particularly in split control deals. This is because split control deals rely more on the renegotiation-based channel for incentive provision, thereby making them more vulnerable to the effects of the tax policy.

Table 7 reports the results of this analysis. We use a within industry-year estimator across both columns. The outcome variable is the upfront fee in column 1 and annual fee in column 2. Our findings provide support for our hypothesis, indicating that split control deals are associated with larger reduction in fees compared to non-split control deals following the

[34]Following Murfin (2012), we estimate the covariance matrices of strictness measure using historical changes in the natural logarithm of ebitda-to-debt ratio, interest coverage ratio, fixed charge coverage ratio for each borrower-deal, as these three are the most commonly seen in the leveraged loan deals.

implementation of the tax policy. Specifically, we observe that split control deals experience additional declines of 98 basis points (0.78 standard deviations) in the upfront fee and 72 basis points (1.71 standard deviations) in the annual fee after the tax policy. Thus, our results demonstrate that the tax policy leads to a more pronounced reduction in advance payments for split control deals compared to non-split control deals.

Loan purpose and deal sponsorship. The existing literature suggests that buyouts and private equity sponsorship can reduce agency costs and increase firm value by improving corporate governance and fostering managerial discipline (e.g., Jensen and Meckling (1976); Jensen (1986); Lehn and Poulsen (1989); Kaplan (1989); Smith (1990); Innes (1990); Muscarella and Vetsuypens (1990); Cotter and Peck (2001); Badoer et al. (2021)). Consequently, private equity can effectively serves as an external monitor and deals with private equity firms are considered less prone to agency problems. In Hypothesis 3, we posit that as banks' incentives to monitor borrowers increase with reductions in renegotiation costs, they are more likely to enter into split control deals with firms that are subject to greater agency frictions and require more efficient monitoring. Applying this prediction in the context of private equity firms, we thus hypothesize that split control deals after the tax policy are less likely to involve private equity sponsors, fund buyouts, or use unitranche financing – a type of flexible financing used for funding acquisitions and mid-size buyouts.

Table 8 presents the findings. We use a within industry-year estimator across all columns. The outcome variables are indicators reflecting whether a deal lacks a private equity sponsor or deal guarantor (column 1), whether a deal is used for a buyout (column 2), and whether a deal utilizes unitranche financing (column 3). Our findings support our hypothesis by revealing that after the tax policy, the likelihood that a split control deal does not feature a sponsor or deal guarantor is higher by an additional 4.11 percentage points (0.35 standard deviations). Furthermore, the likelihood of a split control deal being used for a buyout decreases by an additional 20 percentage points (0.63 standard deviations), while the likelihood of utilizing unitranche financing in split control deals decreases by 2.60 percentage points (0.31 standard deviations). Hence, our findings complement Haque et al. (2023), which also documents that PE sponsors' actions substitute for bank monitoring and are associated with greater non-bank participation in the syndicated loan market.

Boundary of the leveraged loan market. Our findings so far indicate that following the tax policy, banks are more likely to enter into split control deals with firms that face higher agency frictions. To further investigate the impact of reduced renegotiation costs on credit provision to marginal firms in terms of credit rating, we analyze changes in the likelihood of banks contracting split control deals with speculative borrowers. A borrower

is classified as speculative if it holds a Moody's credit rating of B3 or lower. This analysis allows us to examine whether the tax policy affects the credit relationships between banks and riskier borrowers.

Table 9 presents the results from this analysis. We do not include any fixed effects in column 1, while year and industry-year fixed effects are sequentially added in columns 2 and 3, respectively. When renegotiation costs are lower, there is an overall increase in the likelihood of speculative borrowers receiving credit deals. However, the effect is more pronounced for split control deals compared to non-split control deals. Specifically, the likelihood that a speculative borrower receives a credit deal is higher by an additional 7.55 to 8.72 percentage points for split control deals compared with non-split control deals, after the tax policy. This constitutes additional increases of 0.34 to 0.39 standard deviations. These point estimates are economically meaningful, stable, and statistically significant at the 1% level across all specifications. Hence, our findings demonstrate that an exogenous reduction in renegotiation frictions can expand the boundary of the leveraged loan market, particularly for loan deals where banks hold relatively small shares.

Usage of revolving credit. Finally, in our theoretical analysis, we propose that the use of revolving credit in loan agreements can strengthen the commitment of monitoring creditors to conduct effective monitoring, as compared to term loans. This is because revolving credit grants the monitoring creditor more bargaining power by allowing them to threaten the borrower with the withdrawal of undrawn credit from the line. Our model thus predicts that higher (lower) renegotiation frictions lead monitoring creditors, particularly in split control deals, to rely more (less) on revolving credit in terms of incentive provision for monitoring.

Accordingly, we empirically test whether revolving credit facilities play a smaller role in the provision of monitoring incentives after the tax policy. Table 10 reports the results. The dependent variable is the revolving credit share of a deal. We include column 1 without any fixed effects, followed by columns 2 and 3 with the inclusion of year and industry-year fixed effects, respectively. We find that after the tax policy, new split control deals exhibit a smaller revolving share compared to non-split control deals. Specifically, split control deals experience additional declines in the revolving credit share by 4.59 to 7.01 percentage points, corresponding to 0.12 to 0.18 standard deviations, after the tax policy. Therefore, the empirical findings align with the theoretical predictions outlined in Section 2.

5.4 Impact on (Pre-existing) Loan Outcomes

To supplement our analysis in Section 5.3 on how frictions in renegotiation affect ex-ante contracting, we examine the impact of the tax policy on the ex-post performance of existing

loan deals

In our ideal thought experiment, we compare the performance changes of two borrowers – one that has split control contracts to one that does not – before and after the tax policy. Recall that in Hypothesis 2, we propose that following a reduction in renegotiation frictions, firms with pre-existing split control deals at the time of TD9599 exhibit a larger performance improvement than firms without split control deals do. We refer to firms with pre-existing split control deals at the time of TD9599 as *split control borrowers* and firms without pre-existing split control deals at the time of TD9599 as *non-split control borrowers*. To this end, we run the following regression specification, comparing how firms with pre-existing split control deals before the tax policy perform, relative to firms without pre-existing split control contracts, after the passage of the policy:

$$\text{Perf}_{i,s,t} = \mu_i + \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_i \times \text{Post}_t + \epsilon_{i,s,t}. \tag{11}$$

The dependent variable is the performance of firm i of industry s in year t. The main explanatory variable, Split control$_i \times$ Post$_t$, is the interaction between whether firm i has split control deals on its balance sheet and whether year t is after TD9599. Split control$_i$ is an indicator variable that equals to 1 if firm i contracted a split control deal. Firm fixed effects are added to control for time-invariant or slow-moving firm characteristics that might potentially affect firm performances. Industry×Year fixed effects are included to capture the time-varying industrial factors that might affect firms' performance metrics.

The dependent variable, *Perf*, captures various measures of firms' performance. Specifically, we examine the return on assets, the probability of default within one year, three years, and five years. To estimate these probabilities, we employ the Merton Distance-to-Default methodology, which utilizes historical data on market capitalization, equity volatility, long-term debt, and current liabilities. The "Distance-to-Default" represents the difference between the firm's asset value and the face value of its debt, scaled by the standard deviation of the firm's asset value à la Merton (1974).

We present our findings in Table 11. In particular, column 1 demonstrates that split control firms experience an additional 7.3% improvement in return on assets (ROA) compared to non-split control firms after the tax policy. This improvement corresponds to an additional increase of 0.0519 standard deviations. [35] Furthermore, column 2 shows that split control firms experience an additional decline of 1.20% in their one-year default probabilities relative to non-split control firms after the tax policy (0.0517 standard deviations). The

[35]The calculation is as follows: 0.0519× 0.0534 (standard deviation of ROA before the tax event) and divided by 0.038 (mean of ROA before tax event). The report on other magnitudes follows the same method.

magnitudes of the additional decreases in the three-year and five-year default probabilities are similar.

Our analysis also examines the strength of firms' balance sheets. We find that after the tax policy, firms with split control deals on their balance sheet experience significant improvements. Specifically, Table 12 shows that these firms experience an additional 14% decrease (0.11 standard deviations) in their debt-to-EBITDA ratio, indicating a healthier financial position.[36] Moreover, the retained earnings of these firms increase by an additional 9.3% (0.02 standard deviations), indicating improved profitability and net worth. Additionally, these firms experience an additional 38% decline (0.15 standard deviations) in net debt issuance, indicating a reduction in borrowing. Lastly, their sales scaled by total assets increases by an additional 7.1% (0.07 standard deviations), indicating growth in business activity.

This analysis provides direct evidence in support of our model, demonstrating that reductions in renegotiation costs have a more pronounced impact on the performance of split control borrowers compared to non-split control borrowers (Hypothesis 2). We defer detailed discussion on this issue and related policy implications to Section 5.5.

5.5 Discussion and Policy Implications

The dramatic increase in institutional investors' participation in the risky segment of corporate lending, that requires intensive monitoring, raises some questions regarding the outcomes in related credit markets. In particular, we ask whether the resulting lower stake held by the bank lenders necessarily leads to insufficient monitoring and suboptimal loan outcomes. If so, how can regulatory and fiscal policy be adjusted to minimize the inefficiencies associated with the rising participation of institutional investors? While we do not aim to provide definitive normative answers to these questions, the findings we present above in this section have some important policy implications regarding this issue.

Our findings suggest that the level of monitoring prior to the tax policy was potentially insufficient, as evidenced by the larger improvement in performance for split control borrowers after the policy enactment. Put differently, if creditors had sufficiently monitored borrowers to ensure proper behavior, we would expect to see little effect on loan outcomes following changes in renegotiation frictions. This implies that the inflow of non-monitoring institutional investors, which has led to the growing presence of split control loan deals, may lead to insufficient monitoring in the leveraged loan market. This finding is similar to the

[36] 0.1146×21.69 gives an average of 2.48 unit decrease in debt-to-ebitda ratio. Compared to the pre-event average debt-to-ebitda ratio of 17.31, this amounts to 14% decrease.

logic in Paravisini (2008), which claims that borrowers' underinvestment is due to financial constraints, and exogenous shocks to the credit supply side lead to an increase in borrowing and investment.

Finally, our findings on the contractual impact of the tax policy also have implications beyond the leveraged loan market. For instance, the decrease in bank lenders' usage of revolving credit after the tax policy, particularly for split control deals, suggests that in the presence of non-monitoring institutional investors, banks may rely heavily on revolving credit to commit to monitoring, unless renegotiation frictions are sufficiently low. This, in turn, may increase the banking sector's vulnerabilities to demand-driven liquidity shocks or potentially squeeze the banking sector's supply of credit lines to borrowers who rely on them for liquidity insurance purposes. Therefore, policymakers may consider these implications when designing regulations for credit markets that involve non-monitoring creditors with limited capabilities.

Our findings suggest that reducing renegotiation frictions may be a viable policy measure to maintain sufficient incentives for banks to conduct costly monitoring with small stakes. By addressing renegotiation frictions, policymakers can encourage effective monitoring practices and enhance the overall stability and efficiency of credit markets. In summary, our study underscores the importance of considering the implications of institutional investor participation and the resulting monitoring dynamics in credit markets.

6 Conclusion

In our study, we identify and present empirical evidence supporting a novel mechanism that expands upon the conventional wisdom that emphasizes the importance of banks retaining a significant stake in their originations to ensure adequate monitoring incentives. The increasing participation of institutional investors in the risky segment of corporate lending, which requires effective creditor monitoring, poses a challenge to the conventional wisdom of high skin in the game held by bank lenders. This paper proposes a new mechanism that rationalizes this *monitoring with small stakes* puzzle and provides empirical evidence to support and identify this mechanism.

A creditor is incentivized to incur monitoring costs and conduct monitoring activities either because she may incur losses from not monitoring or because she may expect that her monitoring efforts will be rewarded. Based on this intuition, we propose a novel framework that identifies two sources of incentive provision for banks to monitor: a skin in the game-based mechanism that relies on banks retaining loans, and a rent extraction-based mechanism that relies on banks extracting payoffs from renegotiation, which is triggered by

their monitoring activities.

We apply this framework to help us understand the contractual and real outcomes in the leveraged loan market, which features high participation of institutional investors. Our empirical study compares characteristics of loan deals in this particular segment of the credit market and reveals that the split control arrangement of credit contracts is more likely to be applied to borrowers who are less prone to agency frictions or in situations where creditors have stronger bargaining positions. In other words, having the bank hold a smaller stake is less costly when monitoring is less essential or if there is an alternative source that effectively provides incentives for monitoring.

To empirically identify the key mechanism in our theoretical framework, we utilize the activation of TD9599 tax credit as a natural experiment to conduct an event-based analysis. We exploit the plausibly exogenous variation in the expected net payoff to creditors from renegotiation generated by TD9599. Our findings suggest that a less frictional renegotiation environment improves creditors' incentives to monitor and facilitates the participation of non-monitoring institutional investors in the leveraged loan market. Using split control deals as proxies for low bank skin in the game, our empirical findings suggest an asymmetric policy impact on both contracting and real outcomes for split control versus non-split control credit deals. On the contracting side, we find that the tax policy significantly affects the contractual features of new split control deals relative to non-split control deals. On the real side, we find that the passage of the tax policy has a greater impact on the performance of borrowers with existing split control deals compared to those without such deals. We provide direct evidence that these differences are due to changes in banks' monitoring activities, which are associated with higher payoffs during renegotiation.

In summary, our analysis addresses the widely debated concern of whether traditional bank-monitored corporate lending has become more arm's length and less effective in monitoring leveraged borrowers as the participation of institutional investors has increased. The novel mechanism proposed and empirically tested in our analysis helps rationalize the *monitoring with small stakes* puzzle in the leveraged loan market. The insights from this study may be applicable to other credit markets which face similar changes in the composition of lenders.

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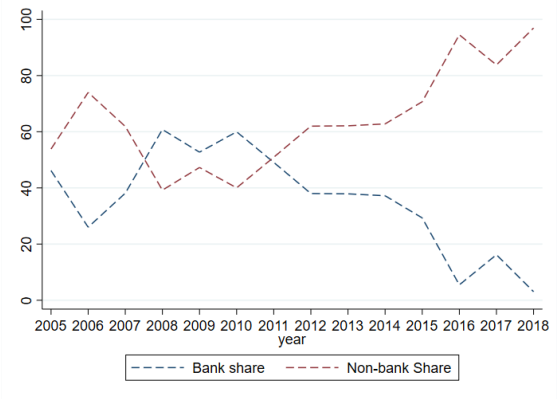
Figure 2. Aggregate Trend of the Leveraged Loan Market

This figures below show the aggregate trend of the leveraged loan market. The first figure (top left) plots the time trend of bank lender and non-bank lenders' dollar share in the leveraged syndicated loan market. The red dashed line shows the proportion of aggregate loan amount lent by non-bank lenders, the blue dashed line shows the proportion of aggregate loan amount lent by bank lenders. Non-bank lenders mainly include mutual funds, pension funds, hedge funds, and other types of institutional investors. The second figure (top right) plots the time trend of the proportion of deals with non-bank lenders. The third figure (bottom) shows the proportion of total dollar amount of deals with institutional lenders participation over time. The frequency of the data is annual.



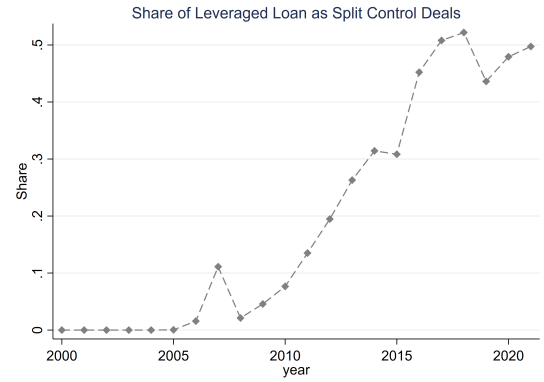


Figure 3. Aggregate Trend in Contract Features in Leveraged Loan Market

The two figures below shows the aggregate trend of contracting features of deals in leveraged loan market for split and non-split control deals. The left panel shows the average number of covenants per deal for split and non-split control deals from 2005-2018. The right panel shows the average rounds of renegotiation for split and non-split control deals. Details on construction is provided in Section 3. The frequency of the data is annual.

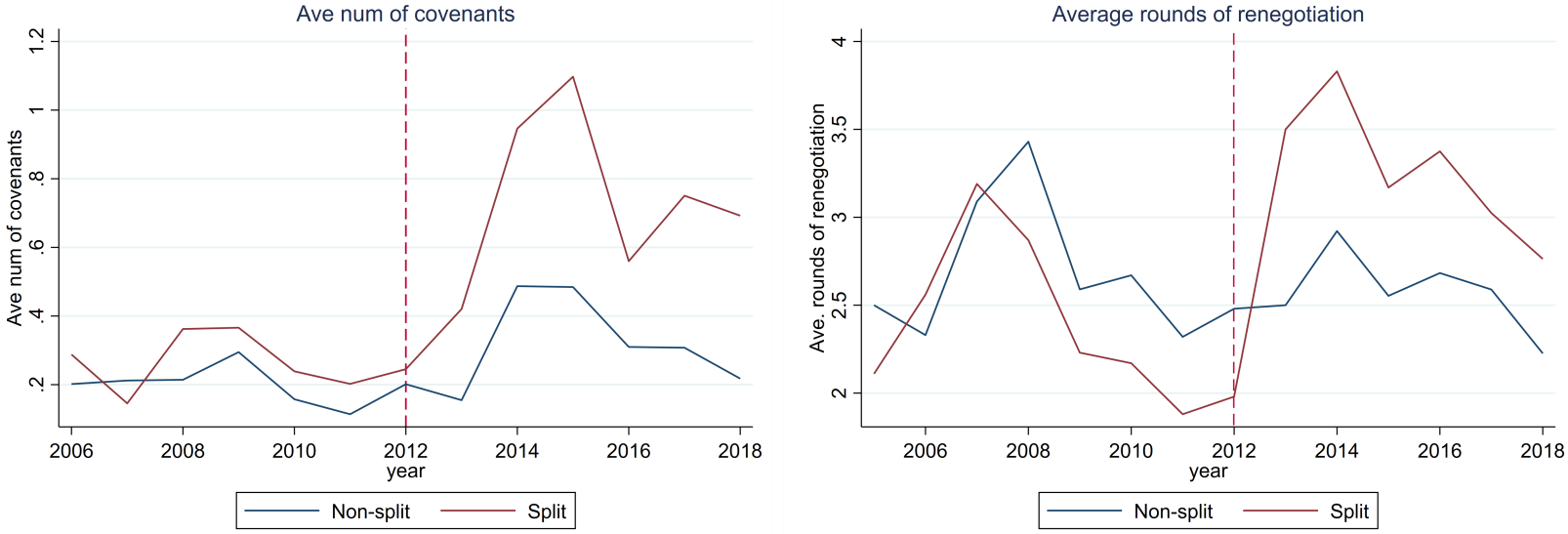


Figure 4. Aggregate Trend in Contract Features by Covenant Categories

The figures below show the aggregate trend of covenant inclusion of leveraged loan market for split control and non-split control deals. The y-axis of each figure represents the share of split control deals or share of non-split control deals with certain specific type of financial covenant in loan contracts over time. Details on variable definition and construction are provided in Section 3. The frequency of the data is annual.

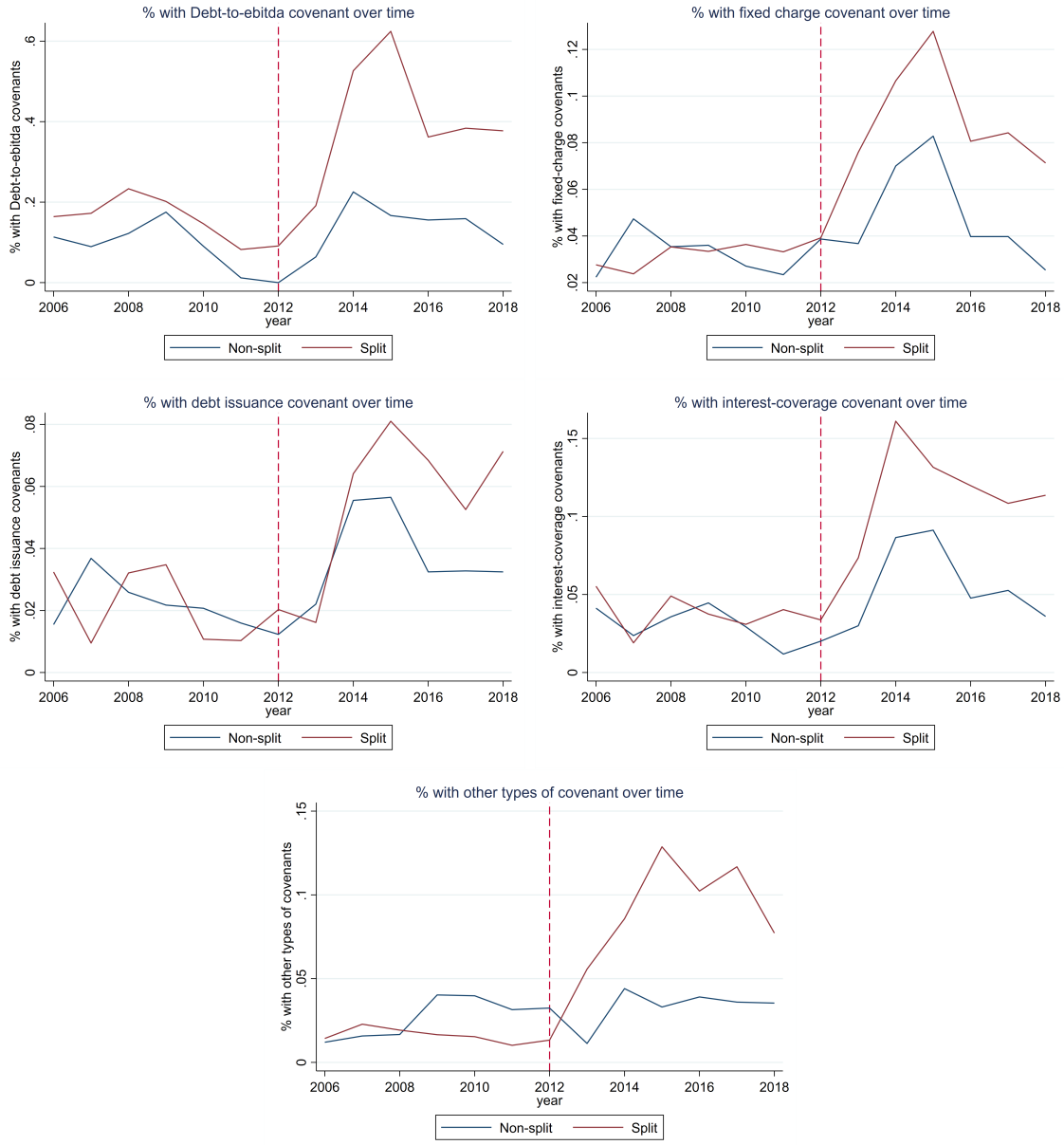


Figure 5. Differential Responses of Contract Features by Split and Non-split Control around Tax Policy Change

The figures below show the estimated coefficients capturing differential responses of contract features in split control and non-split control deals around the time window of the tax policy change. The regression equation is as follows:

$$\text{contract feature}_{d,s,t} = \gamma_s + \eta_t + \mu \times 1[\text{Split}]_{d,t} + \sum_{j \in [2009,2015]}^{j \neq 2012} \beta_j 1[\text{Split}]_{d,s,t} \times 1[\text{t=j}] \times + \pi X + \epsilon_{d,s,t}$$

Coefficients β_j's are plotted. Control variables include logarithmic of loan amount and loan maturity. Details on variable definition and construction are provided in Section 3. The frequency of the data is annual.

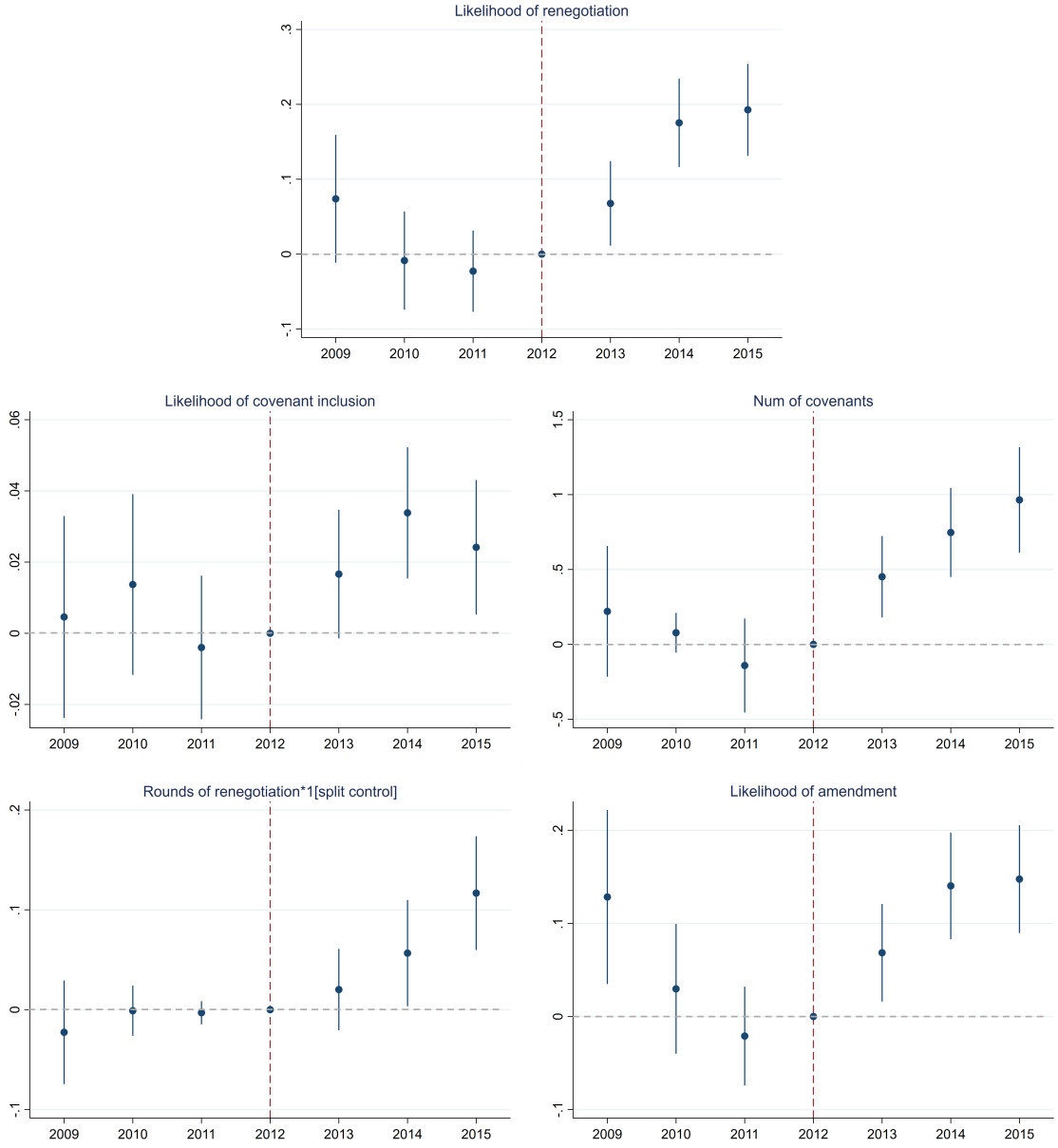


Table 1. Deal Characteristics by Split Control and Non-Split Control

Panel A: Non-split Control	Mean	SD.	P25	Median	P75
Bank share	0.7121	0.2500	0.1583	0.5233	0.9500
No. of lead	2.4500	1.9333	1.0000	2.0000	3.0000
No. of lender	4.7455	5.3333	2.0000	3.0000	6.0000
Secured	0.6333	0.4867	0.0000	1.0000	1.0000
Maturity	1596.1000	624.6100	1096.0000	1826.0000	1827.0000
Amount	179.0100	424.0600	25.0000	65.0000	175.0000
Spread	347.1775	164.1992	225.0000	300.0000	425.0000
Panel B: Split-control	Mean	SD.	P25	Median	P75
Bank share	0.2252	0.4821	0.0000	0.1667	0.7500
No. of lead	3.7221	3.0909	1.0000	3.0000	5.0000
No. of lender	5.2000	4.3000	2.0000	4.0000	7.0000
Secured	0.9645	0.1925	1.0000	1.0000	1.0000
Maturity (Days)	2132.6453	529.9552	1826.0000	2192.0000	2557.0000
Amount	621.9999	806.3333	184.5000	365.5000	733.0500
Spread	406.667	173.6667	300.0000	375.0000	475.0000

The table above compares deal characteristics for split control and non-split control deals. Panel A presents deal characteristics for non-split control deals. Panel B presents firm characteristics for split control deals. Column 1 indicates various deal characteristics including bank share, average lead share, number of lead banks, number of lenders, probability of whether the deal is secured, maturity, amount, and spread. Columns 2 through 7 indicate the sample mean, 25^{th} percentile, median, 75^{th} percentile, mean, and standard deviation values. The table shows summary statistics for all deals between 2005-2018.

Table 2. Changes in Contract Features After the Tax Policy: Ex Post Renegotiation and Rent Extraction

	Acceleration	Fees	Extra covenants	Increased interest	Extra collateral	Decrease loan amount
	(1)	(2)	(3)	(4)	(5)	(6)
Split Control×Post	0.0329***	0.0084***	0.0154***	0.0328***	0.0304***	0.0969***
	(0.0053)	(0.0031)	(0.0040)	(0.0035)	(0.0044)	(0.0236)
Split Control	0.1512***	0.0735***	0.0873***	0.0488***	0.1036***	0.0002
	(0.0038)	(0.0022)	(0.0029)	(0.0025)	(0.0031)	(0.0002)
Industry×Year	✓	✓	✓	✓	✓	✓
N	206,814	206,814	206,814	206,814	206,814	206,814
Adj. R^2	0.02	0.02	0.01	0.01	0.02	0.09

The table presents the renegotiation outcomes of credit agreements for split control and non-split control deals before and after the activation of TD9599. The regression equation is as follows:

$$\text{Renegotiation}_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_d \times \text{Post}_t + \beta_1 \mathbb{1}[\text{Split control}]_d + X_{d,s,t} + \epsilon_{i,s,t}$$

$\mathbb{1}[\text{Split control}]_i$ is an indicator variable that equals to 1 if deal d is a split control. The dependent variables are indicator variables indicating the occurrence of renegotiation outcome. "Acceleration" indicates accelerated repayments of loans or shortening of maturity, "Fees" indicates the occurrence of amendment fees, extra monitoring fees and extension fees. "Increased interest" indicates the occurrence of increases in loan interest rates. "Extra collateral" indicates the occurrence of extra borrowing base requests. "Decrease loan amount" indicates the occurrence of reduction in credit limit of the revolver credit line. Deal control variables (X) include the deal size and maturity. Industry classification (s) is at 2-digit SIC level. $\gamma_{s,t}$ captures the industry$times$year fixed effects. The regression is at deal-year level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in in parentheses.

Table 3. Changes in Contract Features After the Tax Policy: Monitoring Intensity in Financial Contracts

	Financial statement	Field Exam/Inspection	Frequency
	(1)	(2)	(3)
Split Control×Post	0.0154*	0.0712**	-3.0186*
	(0.0710)	(0.1087)	(1.4259)
Split Control	-0.0632	-0.8020	3.7678
	(0.5162)	(0.5559)	(2.7255)
Industry× Year	✓	✓	✓
Deal controls	✓	✓	✓
N	149	149	149
Adj. R^2	0.12	0.05	0.09

The table presents the contractual monitoring intensity for credit agreements initiated before and after the activation of TD9599:

$$\text{Monitoring}_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_d \times \text{Post}_t + \beta_1 \mathbb{1}[\text{Split control}]_l + X_{d,s,t} + \epsilon_{i,s,t}$$

$\mathbb{1}[\text{Split control}]_d$ is an indicator variable that equals to 1 the deal is a split control deal. The dependent variables are indicator variables indicating the monitoring obligation and intensity in the credit agreement. "Financial Statement" indicates that the creditors requests submission of financial statement. "Field Exam/Inspection" indicates the commitment of field examination and inspection of firms assets in the credit agreement. "Frequency" measures the frequency of financial statement delivery required by the credit agreement. The frequency could be 12 months (annually), 3 months (quarterly), or 1 month (monthly). The regression is at the deal level. Deal control variables (X) include the deal size and maturity. Industry classification (s) is at 2-digit SIC level. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at deal contract level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in in parentheses.

Table 4. Changes in Contract Features After the Tax Policy

	1[Covenants]	Num Cov	1[Renegotiated]	1[Amended]	Rounds	1[Covenants]	Num Cov	1[Renegotiated]	1[Amended]	Rounds
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Split Control×Post	0.0204***	0.4230***	0.1238***	0.1240***	0.4847**	0.0218***	0.3299***	0.1235***	0.1238***	0.5386**
	(0.0045)	(0.0977)	(0.0163)	(0.0163)	(0.2376)	(0.0046)	(0.0471)	(0.0164)	(0.0164)	(0.2412)
Split Control	-0.0004	-0.0693	-0.1429***	-0.1432***	-0.0843	0.0047**	-0.0088	-0.1394***	-0.1398***	-0.1005
	(0.0020)	(0.0904)	(0.0155)	(0.0155)	(0.2233)	(0.0022)	(0.0294)	(0.0156)	(0.0156)	(0.2263)
Industry×Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Deal controls						✓	✓	✓	✓	✓
N	22,750	22,750	22,750	22,750	1,727	22,347	22,347	22,347	22,347	1,717
Adj. R^2	0.04	0.02	0.10	0.10	0.09	0.05	0.04	0.12	0.12	0.09

The table presents the heterogeneous changes of deal characteristics for split and non-split control deals in response to the activation of TD9599. The regression equation is as follows:

$$\text{Contract feature}_{d,s,t} = \gamma_{s,t} + \beta \times \text{Split Control}_{d,t} + \beta_1 \times \text{Split Control}_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,s,t} + \epsilon_{d,s,t}$$

1[Covenants] is an indicator variable that equals to 1 if the deal has at least some covenants. "Num Cov" is the total number of covenants. 1[renegotiated] is a dummy variable that equals to 1 if the deal is renegotiated for at least. 1[Amended] is a dummy variable that equals to 1 if the loan is amended for at least once. "Rounds" is the number of rounds of renegotiation. Industry-year included. Industry classification (s) is at 2-digit SIC level. Deal control variables (X) include the deal size and maturity. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in in parentheses.

Table 5. Changes in Contract Features After the Tax Policy: Covenants

	Debt-Ebitda	Int-cov	Fixed charge cov	Debt issuance	Other	Debt-Ebitda	Int-cov	Fixed charge cov	Debt issuance	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Split Control×Post	0.2018***	0.0625***	0.0122*	0.0280***	0.0885**	0.1856***	0.0491***	0.0108*	0.0229***	0.0521***
	(0.0283)	(0.0158)	(0.0055)	(0.0091)	(0.0398)	(0.0262)	(0.0108)	(0.0053)	(0.0082)	(0.0132)
Split Control	0.0140	-0.0095	0.0111*	-0.0075	-0.0500	0.0111	-0.0038	0.0106*	-0.0041	-0.0155*
	(0.0195)	(0.0130)	(0.0059)	(0.0058)	(0.0385)	(0.0166)	(0.0060)	(0.0061)	(0.0041)	(0.0088)
Industry×Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Deal controls						✓	✓	✓	✓	✓
N	22,750	22,750	22,750	22,750	22,750	22,347	22,347	22,347	22,347	22,347
Adj. R^2	0.02	0.01	0.01	0.00	0.01	0.03	0.02	0.01	0.00	0.03

The table presents the heterogeneous responses of covenant inclusions for split and non-split control deals in response to the activation of TD9599. The regression equation is as follows:

$$\text{Contract feature}_{d,s,t} = \gamma_{s,t} + \beta \times \text{Split Control}_{d,t} \times \mathbb{1}[\text{Post}]_t + \beta_1 \times \text{Split Control}_{d,t} + X_{d,s,t} + \epsilon_{d,s,t}$$

The left-hand side variables of the regression are indicator variables which equal to 1 if the loan contract d (issued by a borrower in industry s) in year t has Debt-to-Ebitda ratio covenant, interest coverage ratio covenant, fixed charge coverage ratio covenant, debt issuance covenant and other types of covenants. Some typical examples include extra collateral provision, restrictions on sales of assets, restrictions on changes in management team, etc. Industry classification (s) is at 2-digit SIC level. Column (1)-(5) do not have deal control variables, column (6)-(10) report results with deal control variables. Deal control variables (X) include the deal size and maturity. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in in parentheses.

Table 6. Changes in Contract Features After the Tax Policy: Tightness

	Debt-Ebitda	Int-Coverage	Fixed Charge Coverage	Tightness(Murfin (2012))
	(1)	(2)	(3)	(4)
Split Control × Post	-0.083**	0.230**	0.067**	0.056**
	(0.031)	(0.179)	(0.028)	(0.019)
Split Control	-0.150	-0.078	-0.053	-0.033*
	(0.136)	(0.174)	(0.042)	(0.016)
Industry-Year FE	✓	✓	✓	✓
Deal controls	✓	✓	✓	✓
N	5,450	2,768	2,761	5,450
Adj. R^2	0.303	0.442	0.668	0.587

The table presents the heterogeneous changes of loan covenant values for split and non-split control deals in response to the activation of TD9599. The regression equation is as follows:

$$\text{Cov value}_{d,s,t} = \gamma_{s,t} + \beta \times \text{Split Control}_{d,t} + \beta_1 \times \text{Split Control}_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,s,t} + \epsilon_{d,s,t}$$

In column (1)-(3), we explore how do the most commonly utilized financial covenants vary among split and non-split control deals before and after the tax policy."Debt-Ebitda" is the value of debt-to-ebitda ratio of a loan contract, "Int-Coverage" is the value of interest coverage ratio of a loan contract, and "Fixed Charge Coverage" is the value of fixed charge coverage ratio of a loan contract. In column (4), we explore how do the covenant tightness change for split and non-split control deals before and after the tax policy. The measurement of covenant tightness is based on the methodology in Murfin (2012). Industry classification (s) is at two-digit SIC level. Deal control variables (X) include the deal size and maturity. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in in parentheses.

Table 7. Changes in Contract Features After the Tax Policy: Fees

	Upfront Fee (1)	Annual Fee (2)
Split Control × Post	-98.0246***	-71.9767**
	(37.4337)	(33.4371)
Split Control	96.2406***	40.8101
	(37.2743)	(28.0161)
Industry × Year FE	✓	✓
N	4,557	414
adj. R^2	0.1125	0.1616

This table presents the results from the following regression: $\text{Fees}_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_{d,t} + \beta_1 \times \mathbb{1}[\text{Split control}]_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,s,t} + \epsilon_{d,s,t}$ where s indicates the two-digit industry of the borrower that issued the deal, t represents the year during which the deal was issued. X denotes deal level controls include deal size and maturity. On the right-hand side, the main explanatory variable is the dummy variable $\text{Split Control}_{d,t}$ which is equal to 1 if the deal d issued in year t is a split control deal. $\mathbb{1}[\text{Post}]_t$ is a dummy variable that equals to 1 if year t is after the passage of TD9599. Industry classification (s) is based on the DealScan major industry group. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Changes in Contract Features After the Tax Policy: Deal Sponsorship Activity

	$\mathbb{1}_{\text{No Sponsor}}$ (1)	$\mathbb{1}_{\text{Buyout}}$ (2)	$\mathbb{1}_{\text{Unitranche}}$ (3)
Split Control × Post	0.0411*	-0.1992***	-0.0260***
	(0.0242)	(0.0488)	(0.0028)
Split Control	-0.0240	0.2626***	0.0038***
	(0.0241)	(0.0473)	(0.0008)
Industry × Year FE	✓	✓	✓
N	20,468	20,468	20,468
adj. R^2	0.0251	0.0841	0.0402

This table presents the results from the following regression: $y_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_{d,t} + \beta_1 \times \mathbb{1}[\text{Split control}]_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,st} + \epsilon_{d,s,t}$ where s indicates the two-digit industry of the borrower that issued the deal, t represents the year during which the deal was issued. X denotes deal level controls include deal size and maturity. On the left-hand side, the outcome variable $y_{d,s,t}$ indicates whether the deal lacks a private equity sponsor or deal guarantor in column 1, is used towards buyout activity in column 2, and uses unitranche financing in column 3. On the right-hand side, the main explanatory variable is the dummy variable Split Control$_{d,t}$ which is equal to 1 if the deal d issued in year t is a split control deal. $\mathbb{1}[\text{Post}]_t$ is a dummy variable that equals to 1 if year t is after the passage of TD9599. Industry classification (s) is based on the DealScan major industry group. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 9. Changes in Contract Features After the Tax Policy: Deal Credit Risk

	$\mathbb{1}_{\text{Speculative}}$ (1)	$\mathbb{1}_{\text{Speculative}}$ (2)	$\mathbb{1}_{\text{Speculative}}$ (3)
Split Control×Post	0.0872***	0.0790***	0.0755***
	(0.0281)	(0.0281)	(0.0283)
Split Control	-0.0048	-0.0015	0.0000
	(0.0255)	(0.0255)	(0.0257)
Year FE		✓	
Industry × Year FE			✓
N	21,022	21,022	20,468
adj. R^2	0.0317	0.0343	0.0436

This table presents the results from the following regression: $\mathbb{1}[\text{Speculative}]_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_{d,t} + \beta_1 \times \mathbb{1}[\text{Split control}]_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,t} + \epsilon_{d,s,t}$ where s indicates the two-digit industry of the borrower that issued the deal, t represents the year during which the deal was issued. X denotes deal level controls include deal size and maturity. $\mathbb{1}[\text{Speculative}]_{d,s,t}$ is an indicator for whether a deal is *speculative*. A deal is speculative if it has a rating of B3 or below. On the right-hand side, the main explanatory variable is the dummy variable Split Control$_{d,t}$ which is equal to 1 if the deal d issued in year t is a split control deal. $\mathbb{1}[\text{Post}]_t$ is a dummy variable that equals to 1 if year t is after the passage of TD9599. Industry classification (s) is based on the DealScan major industry group. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 10. Changes in Contract Features After the Tax Policy: Revolving Credit Facilities

	Revolving Share (1)	Revolving Share (2)	Revolving Share (3)
Split Control×Post	-0.0459**	-0.0701***	-0.0565**
	(0.0225)	(0.0224)	(0.0224)
Split Control	-0.1692***	-0.1500***	-0.1190***
	(0.0219)	(0.0216)	(0.0214)
Year FE		✓	
Industry × Year FE			✓
N	17,827	17,827	17,426
adj. R^2	0.3111	0.3164	0.3911

This table presents the results from the following regression: $\text{Revolving Share}_{d,s,t} = \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_{d,t} + \beta_1 \times \mathbb{1}[\text{Split control}]_{d,t} \times \mathbb{1}[\text{Post}]_t + X_{d,t} + \epsilon_{d,s,t}$ where s indicates the two-digit industry of the borrower that issued the deal, t represents the year during which the deal was issued. X denotes deal level controls include deal size and maturity. Revolving share is the share of a deal that is revolving credit. On the right-hand side, the main explanatory variable is the dummy variable $\text{Split Control}_{d,t}$ which is equal to 1 if the deal d issued in year t is a split control deal. $\mathbb{1}[\text{Post}]_t$ is a dummy variable that equals to 1 if year t is after the passage of TD9599. Industry classification (s) is based on the DealScan major industry group. $\gamma_{s,t}$ captures the industry×year fixed effects. The regression is at the deal level. Robust standard errors are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 11. Ex Post Firm Performance

	ROA	Default Prob(1-year)	Default Prob(3-year)	Default Prob(5-year)
	(1)	(2)	(3)	(4)
Split Control× Post	0.0519*	-0.0517***	-0.0520***	-0.0518***
	(0.0304)	(0.0182)	(0.0193)	(0.0181)
Firm FE	✓	✓	✓	✓
Industry×Year FE	✓	✓	✓	✓
AdR-squared	0.7707	0.7197	0.7170	0.7197
N	14821	14859	13440	14859

The table presents the heterogeneous of firm performances in response to the activation of TD9599. The regression equation is as follows:

$$\text{Perf}_{i,s,t} = \mu_i + \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_i \times \text{Post}_t + \epsilon_{i,s,t}$$

$\mathbb{1}[\text{Split control}]_i$ is an indicator variable that equals to 1 if firm i is a split control firm (with split control loans on balance sheet in 2013). ROA is calculated as firms' net income scaled by total assets, Default Prob (1-year), Default Prob (3-year) and Default Prob (5-year) are 1-year, 3-year and 5-year Merton distance-to-default implied default probabilities. Post is an indicator variable that equals to 1 for years later than 2013. Industry-year fixed effects and firm fixed effects are both included. Industry classification (s) is at 2-digit SIC level. $\gamma_{s,t}$ captures the industry×year fixed effects. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in the brackets.

Table 12. Ex Post Firm Balance Sheet Changes

	Debt-Ebitda	Retained earnings	Net debt issuance	Sales/Assets
	(1)	(2)	(3)	(4)
Split Control× Post	-0.1146***	0.0199***	-0.1532***	0.0684***
	(0.0396)	(0.0065)	(0.0438)	(0.0106)
Firm FE	✓	✓	✓	✓
Industry×Year FE	✓	✓	✓	✓
AdR-squared	0.6215	0.7438	0.4394	0.9491
N	14814	21431	22926	21431

The table presents the heterogeneous of firms' balance sheet healthiness in response to the activation of TD9599. The regression equation is as follows:

$$\text{Perf}_{i,s,t} = \mu_i + \gamma_{s,t} + \beta \times \mathbb{1}[\text{Split control}]_i \times \text{Post}_t + \beta_1 \mathbb{1}[\text{Split control}]_i + \epsilon_{i,s,t}$$

$\mathbb{1}[\text{Split control}]_i$ is an indicator variable that equals to 1 if firm i is a split control firm (with split control loans on balance sheet in 2013). Debt/Ebitda is calculated as book debt scaled by Ebitda. "Retained earnings" is retained earning scaled by total assets. Net debt issuance is calculated as book debt less lagged book debt, scaled by total assets. Sales/Assets is sales scaled by total assets. Industry-year fixed effects and firm fixed effects are both included. Industry classification (s) is at 2-digit SIC level. $\gamma_{s,t}$ captures the industry×year fixed effects. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in the brackets.

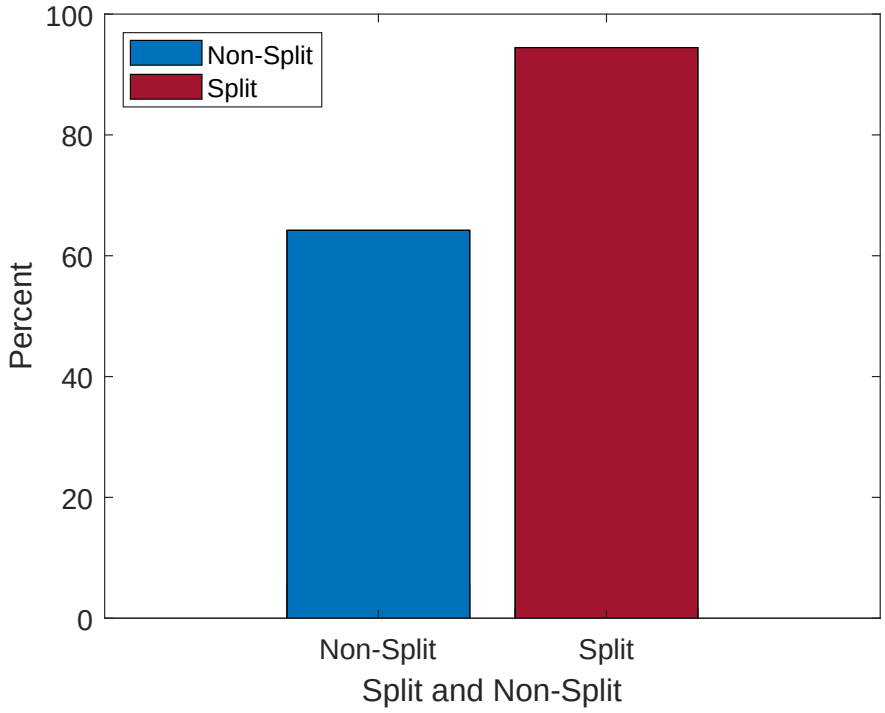
Online Appendix for:

"Monitoring with Small Stakes"

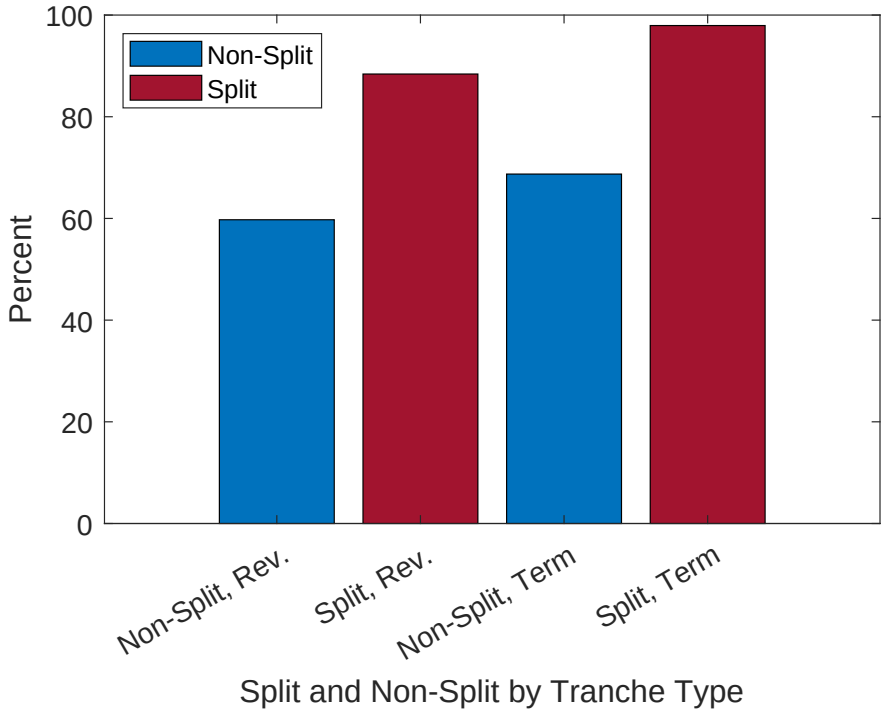
A Figures and Tables

Figure A.1. Secured Lending by Split Control

This figure presents the percent of secured loans for split control and non-split control loans. Figure 2(a) compares the percent of secured loans for split control loans (red) and non-split control loans (blue). Figure 2(b) compares the percent of secured loans for revolving and term loans for split control and non-split control loans. Over 64% of non-split control loans are secured; over 94% of split control loans are secured. Over 59% of non-split control revolving loans are secured; over 88% of split control revolving loans are secured; over 68% of non-split term loans are secured; over 97% of split control term loans are secured.



(a) Percent of Secured Loans



(b) Percent of Secured Loans by Tranche

Figure A.2. Revolver Share by Split Control

This figure presents the percent of loans that are revolving loans for split control loans (red) and non-split control loans (blue). The revolving loan share is over 44% for non-split control loans and over 21% for split control loans.

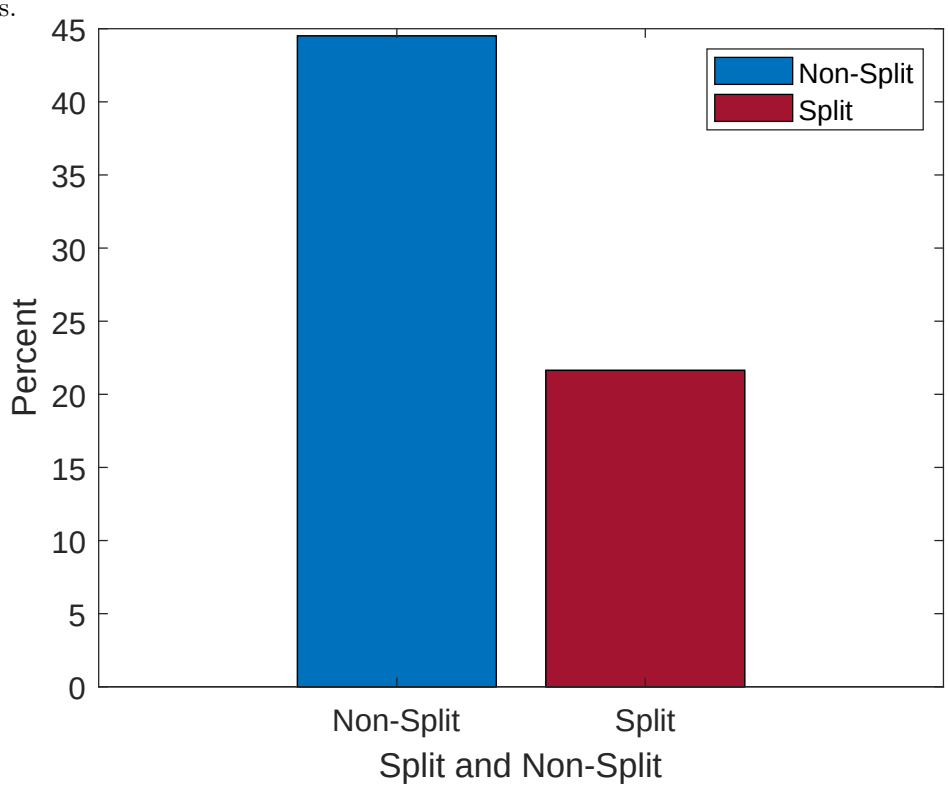


Figure A.3. Percent of Sponsored Loans

This figure presents the percent of loans that are sponsored for split control loans (red) and non-split control loans (blue). The percent of sponsored loans is over 44% for non-split control loans and over 78% for split control loans.

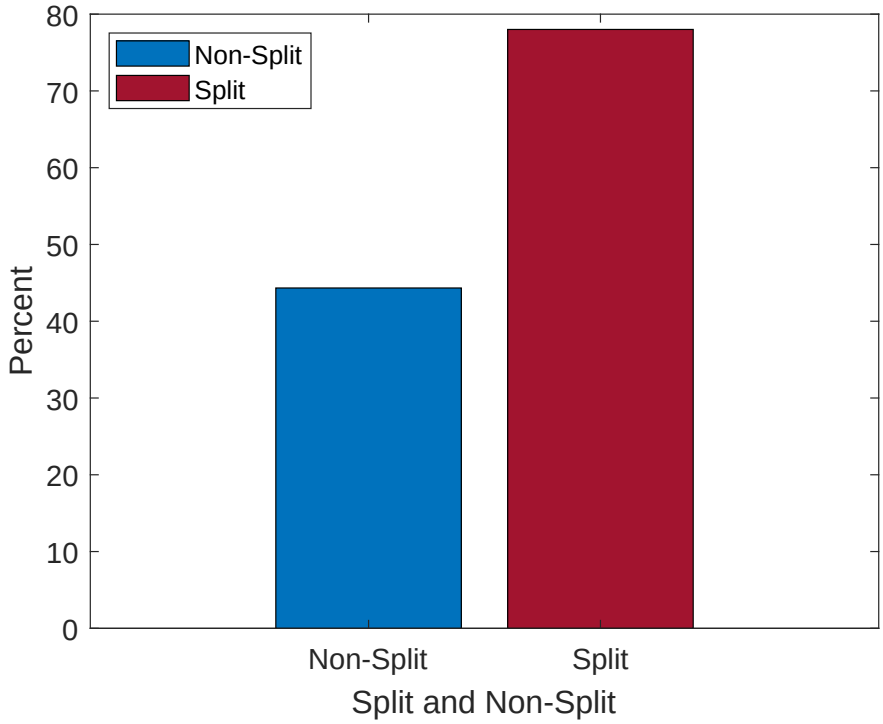


Figure A.4. Industry Distribution by Split Control Deals

This figure presents the industry distribution for split control and non-split control loans. The x-axis reports the industry. The y-axis presents the percent of loans that fall within the industry category designated in the x-axis. Split control deals are represented by the red bars. Non-split control deals are represented by the blue bars.

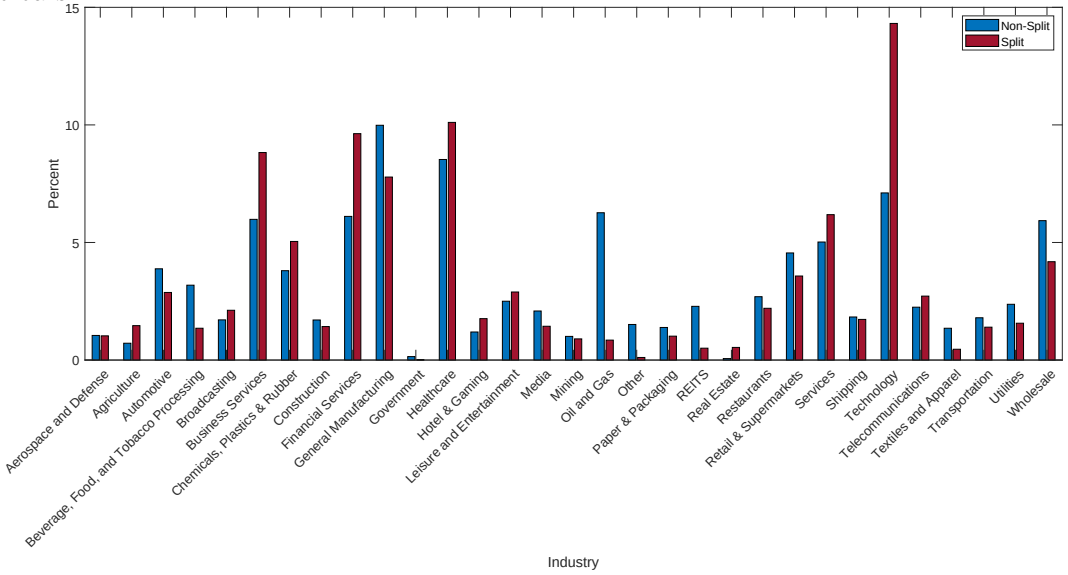


Figure A.5. Asset-Based Lending by Split Control

This figure presents the percent of loans that are asset-based for split control loans (red) and non-split control loans (blue). The asset-based lending share is over 9% for non-split control loans and over 5% for split control loans.

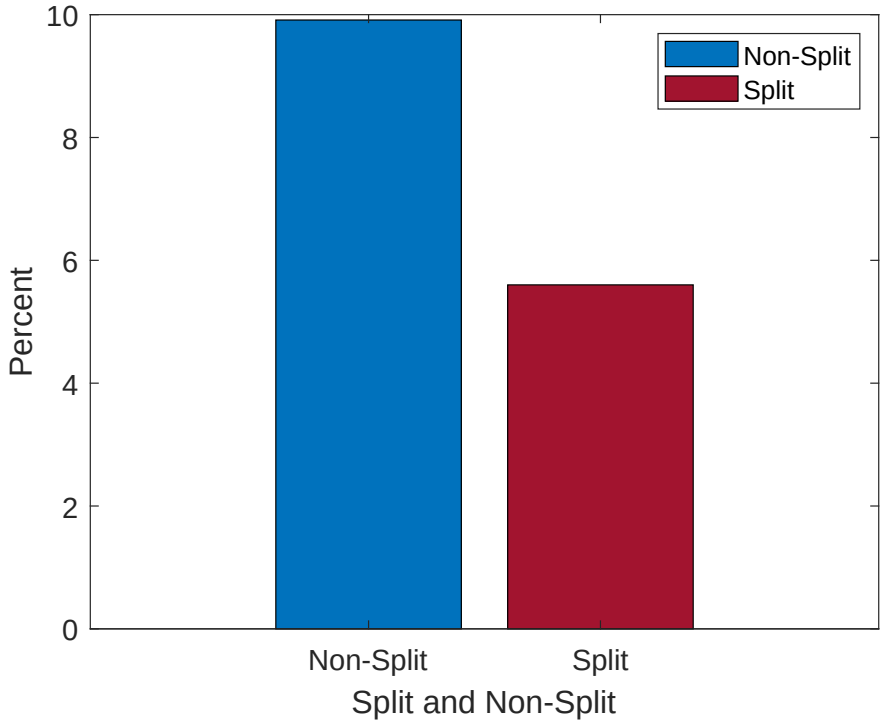
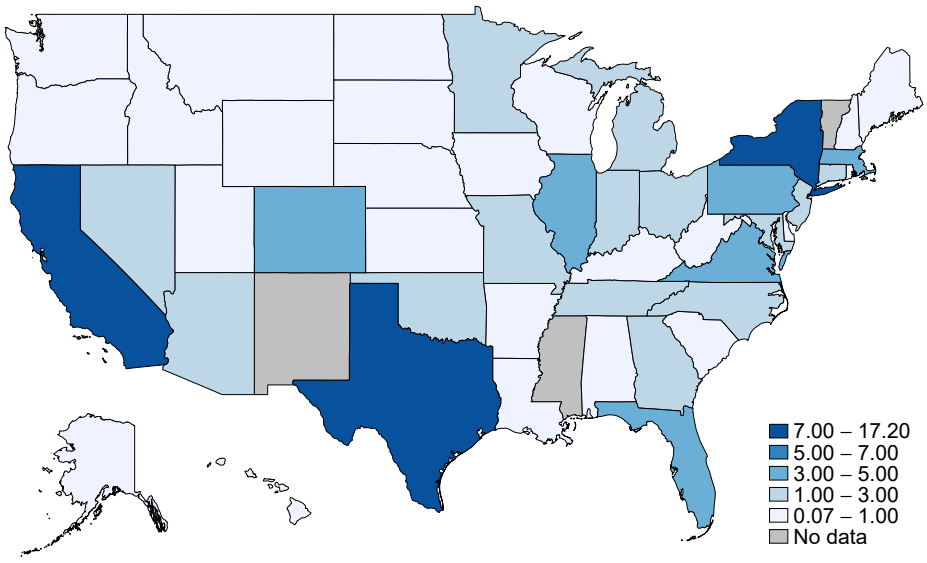
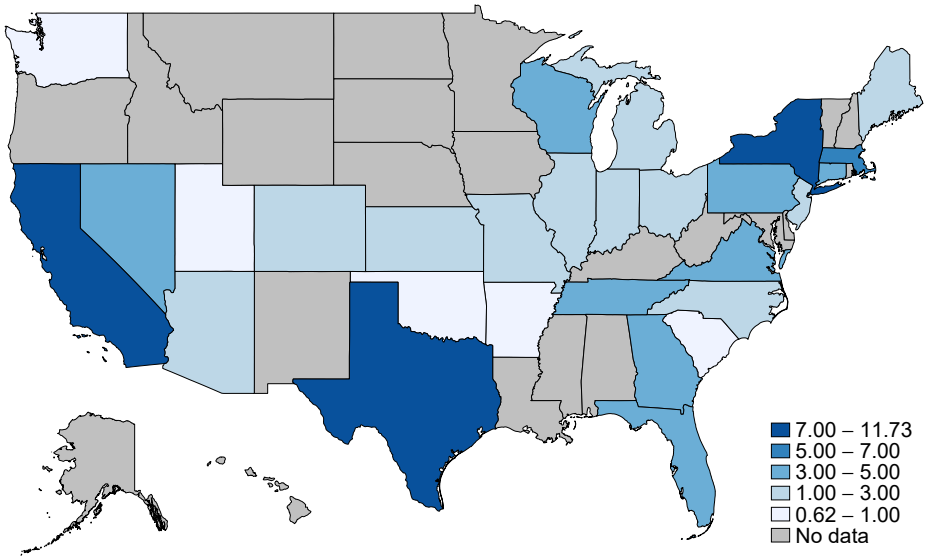


Figure A.6. Geography of Firms by Split Control Borrowers

The figures present the geography of borrowers at the time a deal becomes active for split and non-split control borrowers. The blue gradient indicates the frequency bin of firms operating in that particular geography, e.g., darkest blue indicates that between 7.00% and 11.73% of all firms in the sample operate in that state.



(a) Non-Split Control



(b) Split Control

Figure A.7. Bank Share in Non-split Control Deals

The figure shows the dollar share of loans made by bank lenders in non-split control deals over time in the leveraged loan market. The red line indicates the activation of TD9599.

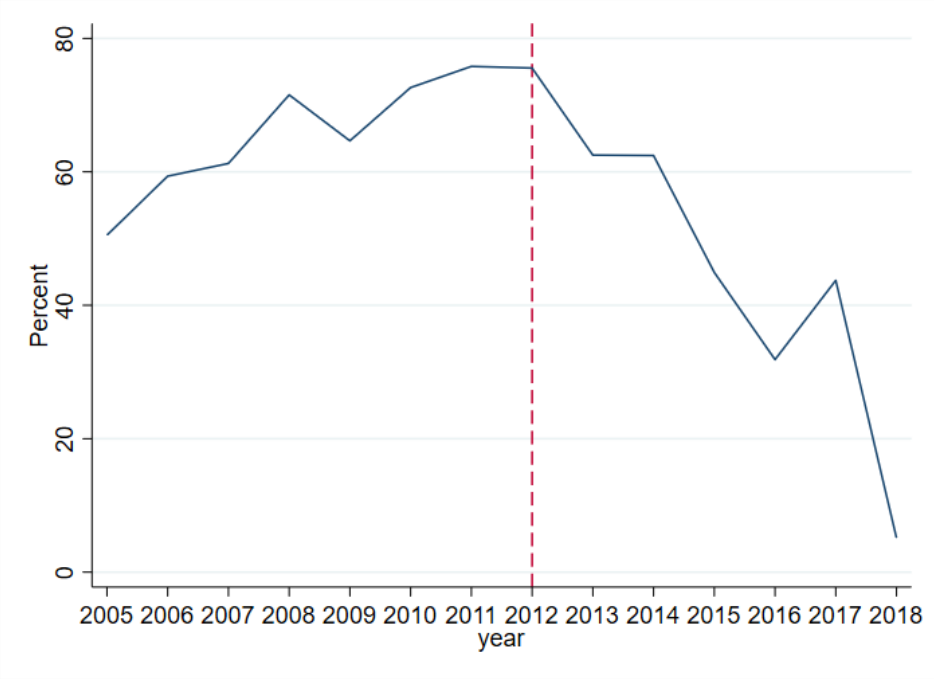


Table A.1. Firm Characteristics by Split Control Borrowers

Panel A: Non-Split Control Borrowers						
	N	P25	Median	P75	Mean	SD
Age	3,372	2.0000	6.0000	9.0000	5.9772	5.3819
Size	4,454	6.0574	7.0234	7.9811	7.0370	1.4940
Net PP&E	4,343	3.9719	5.3607	6.7624	5.2978	2.0857
CapEx	4,154	1.7084	3.0118	4.3365	2.9668	2.0626
Gross PP&E	2,749	5.0826	6.3251	7.5169	6.2004	1.9418
R&D	1,548	0.0000	0.6801	2.4376	1.3109	1.5074
Acquisitions	4,254	0.0000	0.0000	3.0263	1.4694	2.2107
Leverage	4,123	0.2421	0.4080	0.5710	0.4230	0.2644
Debt/EBITDA	3,973	4.7283	13.1782	22.1932	15.3047	31.3498
Liquidity	4,202	0.0153	0.0464	0.1243	0.0965	0.1342
Profitability	3,984	0.0153	0.0280	0.0426	0.0274	0.0386
Sales	4,618	4.1887	5.1600	6.1699	5.1671	1.5175
Collateral	4,078	0.4173	0.6894	0.8785	0.6353	0.2722
Employment	3,246	-0.4943	0.7075	1.7228	0.4944	1.8826
Panel B: Split Control Borrowers						
	N	P25	Median	P75	Mean	SD
Age	386	4.0000	9.0000	14.0000	9.2383	6.6058
Size	486	7.5087	8.2313	9.0564	8.2604	1.1001
Net PP&E	510	5.0042	6.0227	7.2520	6.0895	1.6838
CapEx	481	2.6343	3.6533	4.5850	3.6105	1.5321
Gross PP&E	331	5.7388	6.8057	8.0703	6.8480	1.7074
R&D	212	0.0000	2.6444	3.5660	2.3870	1.7704
Acquisitions	460	0.0000	0.4038	4.5842	2.2587	2.6414
Leverage	470	0.3802	0.4897	0.6134	0.5065	0.2099
Debt/EBITDA	467	12.2333	17.6896	24.0382	18.8334	27.1313
Liquidity	480	0.0299	0.0734	0.1369	0.1017	0.1052
Profitability	484	0.0208	0.0287	0.0383	0.0302	0.0198
Sales	503	5.4894	6.1920	7.0324	6.2538	1.0852
Collateral	463	0.3004	0.4684	0.6891	0.4927	0.2356
Employment	383	1.0296	1.8083	2.7081	1.8311	1.2567

The table compares firm characteristics at the time a deal becomes active for split control and non-split control borrowers. Panel A presents firm characteristics for non-split control borrowers. Panel B presents firm characteristics for split control borrowers. Column 1 indicates various firm characteristics including firm, age, size, net PP&E, capital expenditure, gross PP&E, R&D. acquisitions, leverage, debt/EBITDA, liquidity, profitability, sales, collateral, and employment. Columns 2 through 7 indicate the number of observations, 25^{th} percentile, median, 75^{th} percentile, mean, and standard deviation values.

Table A.2. Loan Purpose Distribution by Split Control

Loan Purpose	Non-Split (%)	Split (%)
General Purpose	53.4147	52.9621
Leveraged Buyout	10.8831	12.4895
Sponsored Buyout	1.8593	10.4759
Takeover	5.2318	8.2680
Acquisition	11.2265	5.0178
Dividend Recapitalization	4.1783	4.9466
General Purpose/Refinance	1.9687	2.8941
Merger	0.3212	1.1201
Spinoff	0.4236	0.6475
Exit financing	0.6798	0.2007
Dividend or Distribution to Shareholders	0.2187	0.2007
Recapitalization	0.5732	0.1813
Working capital	6.8959	0.1554
Management Buyout	0.1011	0.1101
General Purpose/Stock Repurchase	0.2118	0.0842
Capital expenditure	0.3433	0.0777
Debtor-in-possession	0.9608	0.0712
IPO Related Financing	0.1454	0.0518
Stock Repurchase	0.0761	0.0453

The table compares loan purpose for split and non-split control borrowers. The first column lists the 20 most common loan purposes. The second (third) column indicates the percent of non-split control (split control) loans used towards the loan purpose designated in the first column.

Table A.3. Lender Characteristics by Participation in Split Control Deals

Panel A: No Participation in Split Control Deals						
	N	P25	Median	P75	Mean	SD
Tier-1 capital/Assets	281	0.08	0.10	0.12	0.11	0.07
Operating income/Operating costs	281	1.21	1.33	1.48	1.36	0.31
Net interest margin	281	0.01	0.01	0.01	0.01	0.00
Ln(1+assets)	281	11.91	13.07	14.23	13.27	1.96
Loan/Deposits	281	0.66	0.81	0.94	0.79	0.22
C&I loan/Total loan	281	0.09	0.16	0.26	0.21	0.27
Real estate loan/Total loan	281	0.57	0.70	0.81	0.67	0.29
Personal loans/Total loan	281	0.02	0.05	0.11	0.09	0.21
Agriculture loans/Total loan	281	0.00	0.00	0.03	0.05	0.10
Equity/Assets	281	0.08	0.10	0.12	0.12	0.08
Transactional deposits/Total deposits	281	0.10	0.19	0.33	0.22	0.15
Noninterest income/Total income	281	0.07	0.13	0.21	0.17	0.15
Panel B: Participation in Split Control Deals						
	N	P25	Median	P75	Mean	SD
Tier-1 capital/Assets	131	0.08	0.10	0.14	0.14	0.14
Operating income/Operating costs	131	1.26	1.43	1.66	1.53	0.63
Net interest margin	131	0.01	0.01	0.01	0.01	0.00
Ln(1+assets)	131	14.08	15.44	16.60	15.33	2.23
Loan/Deposits	131	0.69	0.84	0.96	0.80	0.26
C&I loan/Total loan	131	0.10	0.18	0.26	0.22	0.21
Real estate loan/Total loan	131	0.51	0.67	0.80	0.64	0.30
Personal loans/Total loan	131	0.02	0.05	0.12	0.09	0.12
Agriculture loans/Total loan	131	0.00	0.00	0.01	0.02	0.06
Equity/Assets	131	0.08	0.10	0.14	0.14	0.14
Transactional deposits/Total deposits	131	0.08	0.12	0.23	0.18	0.17
Noninterest income/Total income	131	0.09	0.15	0.25	0.22	0.32

The table compares bank lender characteristics at the time a deal becomes active for split control and non-split control borrowers. Panel A presents lender characteristics for non-split control borrowers. Panel B presents lender characteristics for split control borrowers. Column 1 indicates various lender characteristics including tier-1 capital scaled by total assets, operating income scaled by operating costs, net interest margin, logarithmic of total assets, loan-to-deposit ratio, loan profiles, equity-asset ratio, transactional deposits in total deposits and non-interest income scaled by total income. Columns 2 through 7 indicate the number of observations, 25^{th} percentile, median, 75^{th} percentile, mean, and standard deviation values.

Table A.4. Bank Balance Sheet and Split Control Deals

	1[Split control]						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Tier-1 capital/Assets	0.1060***						
	(0.0277)						
ROA		1.7420**					
		(0.6830)					
Loan/Deposits			0.0054				
			(0.0150)				
Noninterest income/Total income				-0.0165			
				(0.0109)			
Equity/Assets					0.0944***		
					(0.0264)		
Bank Size						-0.0408***	
						(0.0042)	
1[Previous Relationship]							0.0266***
							(0.0070)
Bank FE	✓	✓	✓	✓	✓	✓	✓
Industry×Year FE	✓	✓	✓	✓	✓	✓	✓
Deal Controls	✓	✓	✓	✓	✓	✓	✓
AdR-squared	0.21	0.21	0.21	0.21	0.21	0.21	0.21
N	25,469	25,474	25,449	25,474	25,494	26,901	26,901

The table presents the correlation between banks' characteristics and the likelihood of entering a split control deal contract in the leveraged loan market. The regression equation is as follows:

$$1[\text{Split control}]_{b,s,t} = \gamma_{s,t} + \pi_b + \beta \times \text{Bank Char}_{b,t} + \mu\mathbf{X} + \epsilon_{b,s,t}$$

Tier-1 capital/assets is defined as the sum of retained earnings and common equity scaled by total assets, ROA is defined as net income scaled by total assets, Loan/Deposits is defined as total deposits scaled by total loans, Non-interest income/Total income is defined as non-interest income scaled by total income, Equity/Assets is defined as total equity scaled by total assets, Bank Size is defined as the logarithmic of total assets. "1[Relationship] is a dummy variable that equals to 1 if the borrower and the bank had issued any syndicated loans before the current deal. Deal controls include the logarithmic of deal amount, maturity and spread. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are reported in the brackets.

Table A.5. Features of Deals and Pre-shock Firm Balance Sheet Condition

Panel A: Contract Features	Mean	SD	5^{th}	Median	95^{th}
1[Has covenant]	0.951	0.215	1.000	1.000	1.000
Num of covenants	0.377	2.481	0.000	0.000	2.000
1[Renegotiated]	0.171	0.377	0.000	0.000	1.000
1[Ammended]	0.171	0.376	0.000	0.000	1.000
Rounds of renegotiation	0.462	1.302	0.000	0.000	3.000
1[Debt-to-Ebitda]	0.257	0.437	0.000	0.000	1.000
1[Interest-coverage]	0.058	0.500	0.000	0.000	0.000
1[Fixed charge coverage]	0.047	0.486	0.000	0.000	0.000
1[Debt issuance]	0.029	0.445	0.000	0.000	0.000
1[Other]	0.216	0.412	0.000	0.000	1.000
Debt-to-Ebitda ratio	4.3898	1.4806	2.5000	4.2500	6.5000
Interest coverage ratio	2.7095	0.7574	1.5000	2.7500	4.0000
Fixed charge coverage ratio	2.7838	1.9199	1.0000	2.0000	6.0000
Upfront Fee	118.7973	122.7575	12.5000	100.0000	300.0000
Commitment Fee	46.5243	24.2756	25.0000	50.0000	75.0000
Annual Fee	47.4165	42.1419	10.0000	37.5000	150.0000
1[Buyout]	0.1106	0.3137	0.0000	0.0000	1.0000
1[No Sponsor]	0.6146	0.4867	0.0000	1.0000	1.0000
1[Unitranche]	0.0072	0.0846	0.0000	0.0000	0.0000
1[Speculative]	0.0515	0.2210	0.0000	0.0000	1.0000
Revolving Share	0.5674	0.3922	0.0688	0.5261	1.0000
Panel B: Firms' pre-shock balance sheet condition	Mean	S.d.	5-th	Median	95-th
ROA	0.0378	0.0540	0.0000	0.0199	0.1490
Default Prob (1-year)	0.4908	0.0575	0.4894	0.4994	0.5000
Default Prob (3-year)	0.4911	0.0567	0.4900	0.4995	0.5000
Default Prob (5-year)	0.4908	0.0575	0.4898	0.4994	0.5000
Debt/ebitda	17.3176	21.6965	-14.5511	12.3784	72.0627
Retained earning	-0.1189	0.2733	-0.4671	0.0402	0.1756
Net debt issuance	0.0752	0.1775	-0.1081	0.0047	0.5797
Sales/Assets	0.6210	0.7365	0.0021	0.3855	2.1343

The table compares deal features and firms' pre-shock balance sheet healthiness for split control and non-split control deals. Panel A presents the summary statistics for contract features. Panel B presents the summary statistics of firms' balance sheet conditions. Columns 2 through 6 indicate the mean, standard deviation, 5^{th} percentile, median, and 95^{th} percentile values.

B Borrowing with Split Control Deals:

In this section, we conduct a comprehensive empirical study comparing the contractual features of split control and non-split control deals. We focus on dimensions related to creditors' incentives to conduct costly monitoring, as well as the value added by such monitoring activities, and relate them to the contractual arrangement and design of credit deals in the leveraged loan markets.

Borrowers' characteristics: We begin by comparing characteristics of split control borrowers to non-split control borrowers. Appendix Table A.1 presents the borrower characteristics when a deal becomes active. We find that split control borrowers are, on average, well-established firms. These firms are older and larger in size and employment than non-split control borrowers. The split control borrowers invest more as measured by CapEx, R&D, and acquisitions. Moreover, split control borrowers exhibit higher financial ratios – leverage and debt/EBITDA ratios – and report higher liquidity, profits and sales, relative to non-split control borrowers. Overall, these findings suggest that split control deals are more likely to be contracted with borrowers who are less subject to agency problems. Within the conceptual framework of Section 2, one can interpret this as selection based on borrower characteristics. That is, it is less costly for creditors to monitor borrowers who are less likely to engage in inefficient project diversion.

Borrowers of split control deals differ from those of non-split control deals in their industry composition. Appendix Figure A.4 presents the industry distribution of loans in split and non-split control deals.[37] The figure indicates that loans in split control deals are concentrated in the technology, financial services, business services, and healthcare industries, relative to non-split control deals. Overall, split control deals have significantly lower exposures to the oil and gas and general manufacturing industries, relative to non-split control deals. Appendix Figure A.5 documents that the asset-based lending is almost twice as common in non-split control deals compared to split control deals while Appendix Table A.1 documents that split control borrowers report lower collateral than non-split control borrowers. Together, this finding suggests that split control borrowers are more likely to operate in industries with higher intangibles. This is consistent with our conceptual framework in which we posit that split control deals rely more on rent extraction through renegotiation rather than the recovery of salvage value which is more applicable to asset-based lending and is sensitive to banks' skin-in-the-game.

Contract features: Despite differences in the credit risk of split and non-split control deals, a greater share of split control deals are secured relative to non-split control deals. Appendix Figure A.1 exhibits the percent of secured loans for non-split and split control deals. Panel a of Appendix Figure A.1 indicates that 64% of loans in non-split control deals are secured, while almost 95% of loans in split control deals are secured. Panel b of Appendix Figure A.1 disaggregates split and non-split loans based on the type of the loan. The figure indicates that 56% of revolving credit facilities held in non-split control deals are secured, compared to 94% in split control deals. Moreover, 77% of term loans held in non-split loans are secured, compared to 99% in split control deals. Hence, loans in split control deals are

[37] Appendix Figure A.6 shows that the headquarter locations of split control borrowers and non-split control borrowers are similarly geographically distributed.

more likely to be secured, relative to loans in non-split control deals.

In addition to the fraction of being secured, split control deals also exhibit a different structure in the *split* between revolving credit facilities and term loans from the non-split counterparts. We find that the 45% (55%) of non-split control deals are in the form of revolving credit facilities (term loans). This stands in stark contrast to 22% (78%) of split control deals that are in the form of revolving credit facilities (term loans). Further, as described in Section 4.1, the average bank commitment share in the split control deals is 22%, while for non-split control deals, the average bank commitment is 71%. This finding is consistent with a key corollary of our model in Section 2 which contends that the minimum share that needs to be held by monitoring creditors is lower for borrowers with less severe agency frictions.

Nature of loan purposes: To further understand differences in loan characteristics, we examine the nature of loan purposes for split control and non-split control deals. Appendix Table A.2 tabulates the percentage of loans in split and non-split control deals based on the purpose of loans. The table indicates that a substantially larger share of loans in split control deals are used towards sponsored and leveraged buyouts. While the percentage share of split control deals associated with leveraged buyouts is only modestly higher than that in the non-split control deals, the percentage share of sponsored buyouts is almost six times higher in split control (10.5%) than in non split control (1.8%) deals. These findings are corroborated in Appendix Figure A.3 which documents that 44.33% of loans in non-split control deals report a private equity sponsor. In comparison, 78% of loans in split control deals report a private equity sponsor. The extant literature demonstrates that buyouts and private equity activities can reduce agency costs and increase firm value by disciplining managers and improving efficiency (e.g., Jensen and Meckling (1976); Jensen (1986); Lehn and Poulsen (1989); Kaplan (1989); Smith (1990); Innes (1990); Muscarella and Vetsuypens (1990); Cotter and Peck (2001)). Moreover, Badoer et al. (2021) argues that the reputational capital of private equity sponsors can serve as a substitute for maintenance covenants and mitigate agency costs. Our finding that split control deals are more likely used towards buyout purposes, especially privately sponsored, suggests that split control deals are more likely to be arranged for deals less prone to agency frictions.

Lender side factors: Lastly, on the creditor's side, we examine whether characteristics of the bank lenders can explain selection into split control deals. Using a within-bank estimator, we study how the probability of a bank entering a split control deal relates to various bank characteristics. Appendix Table A.4 presents these results. The right-hand side variables in this regression analysis include the tier 1 capital ratio, RoA, loan-to-deposits ratio, noninterest income to total income ratio, employment, financial leverage, size and an indicator for a previous bank-borrower relationship. We select these variables to study how measures of bank regulatory constraints, liquidity, profitability, leverage, size, and bank-borrower relationships are related to participation in split control deals. We account for macroeconomic shocks through year fixed effects, and include the deal maturity, spread and amount as additional controls. All independent variables are standardized for ease of interpretation.

Columns 1 through 5 indicate that that well-capitalized profitable banks are more likely

to participate in split control deals. We find that there is a statistically significant and economically meaningful relationship between a bank's tier 1 capital ratio, RoA, size, financial leverage, and, the bank's participation in a split control deal. We further consider how the strength of lending relationships affects banks' participation in a split control deals. We use size as a proxy for external finance dependence in column 6 and an indicator for whether the bank has previously given a loan to the firm in column 7. These columns indicate that the strength of bank-borrower relationships are meaningful indicators of participation in split control deals.

Overall, our findings suggest that split control deals are less prone to agency frictions. On the borrowers' side, we find that split control borrowers are older, larger, more productive and profitable relative to non-split control borrowers. These borrowers are more likely to operate in the services industries. On the contract side, we find that split control deals are more likely to be secured, feature a smaller share of revolving credit, and are used towards private equity activity relative to non-split control deals. On the lenders' side, we find that well-capitalized, profitable banks with stronger lending relationships are more likely to participate in split control deals.

C Algebraic Proofs

Proof of Proposition 1

First, it is useful to note that in Equation (3) $c''(\theta) > 0$ implies that function $\theta^s(D)$ is increasing in D. Creditor's participation condition is characterized by Eq. (4). Differentiate the LHS of Eq. (4) and comibine with Eq. (3), we get

$$\begin{aligned}\frac{\partial LHS}{\partial D} &= \frac{\partial \theta^s(D)}{\partial D}\left[\frac{1}{2}D + \frac{1}{2}V_C\right] + \frac{1}{2}\theta^s(D) - \frac{\partial \theta^s(D)}{\partial D}\gamma X_L - c'(\theta)\frac{\partial \theta^s(D)}{\partial D} \\ &= \frac{1}{2}\theta^s(D) + \frac{\partial \theta^s(D)}{\partial D}\left[\frac{1}{2}D + \frac{1}{2}V_C - \gamma X_L - c'(\theta)\right] \\ &= \frac{1}{2}\theta^s(D)\end{aligned}$$

Hence the financing boundary is determined by evaluating the face value payment D at $D = X_H$ in Eq. (4).

Therefore, the cutoff level of entrepreneur γ^s that can be finance is determined as

$$\gamma^s = \frac{rI + c(\theta^s) - \frac{1}{2}(1+\beta)X_H + \frac{1}{2}\beta X_L \theta^s}{X_L - \frac{1}{2}X_L\theta^s} \tag{C.1}$$

When the monitoring cost $c(\theta)$ is sufficiently low (e.g., $c(\theta) \to 0$ for any θ), the equilibrium detecting rate θ^s can be sufficiently close to 1 (e.g., $\theta^s \to 1$). Thus we have

$$\begin{aligned}\gamma^s &\to \frac{rI - \frac{1}{2}(1+\beta)X_H + \frac{1}{2}\beta X_L}{X_L} \\ &< \frac{rI - (X_H - X_L)}{X_L} \\ &= \gamma^u\end{aligned}$$

whenever $\frac{2-\beta}{1-\beta} > \frac{X_H}{X_L}$. ■

Proof of Proposition 2

From Eq. (5), we have the equilibrium monitoring effort θ^B given by

$$\theta^B = \frac{1}{2c}\left[f_B(D - \gamma X_L) + \beta(X_H - X_L)\right] \tag{C.2}$$

Thus the sensitivity of monitoring effort to renegotiation friction β is

$$\begin{aligned}\epsilon_{\theta^B,\beta} &= \frac{\partial \theta^B}{\partial \beta} \cdot \frac{\beta}{\theta^B} \\ &= \frac{\beta(D - \gamma X_L)}{f_B(D - \gamma X_L) + \beta(X_H - X_L)}\end{aligned}$$

Therefore, it is easy to see that this sensitivity is higher for loans in which monitoring creditor has smaller stake, i.e., $\frac{\partial \epsilon_{\theta^B,\beta}}{\partial f_B} < 0$. ■

Proof of Proposition 3

First, we can show that $\frac{\partial \theta^B}{\partial f_B} > 0$. To see this, note that differentiating Eq. 5 with respect to f_B, we get

$$c''(\theta^B)\frac{\partial \theta^B}{\partial f_B} = \frac{1}{2}(D - \gamma X_L) \tag{C.3}$$

Since $c''(\theta^B) > 0$, it thus follows that $\frac{\partial \theta^B}{\partial f_B} > 0$. Similarly, it can be shown that $\frac{\partial \theta^B}{\partial D} > 0$.

Next by differentiating the left hand side of Eq. (6) with respect to f_B, we get

$$\frac{\partial LHS}{\partial f_B} = \frac{1}{2}(D - \gamma X_L)\frac{\partial \theta^B}{\partial f_B} > 0, \tag{C.4}$$

and differentiating with respect to D we get

$$\frac{\partial LHS}{\partial D} = \frac{1}{2}(D - \gamma X_L)\frac{\partial \theta^B}{\partial D} + \frac{1}{2}\theta^B > 0. \tag{C.5}$$

Therefore, the credit contract that minimizes monitoring creditor's stake f_B should set $D = X_H$. This implies that the minimum share f_B^* held by the bank, which monitors, is determined by Eq. (7).

Finally, to show that $\frac{\partial f_B^*}{\partial \beta} < 0$, note that by differentiating Eq. (5) w.r.t. β, we get

$$c''(\theta^B)\frac{\partial \theta^B}{\partial \beta} = \frac{1}{2}(X_H - X_L). \tag{C.6}$$

Hence given f_B, $\frac{\partial \theta^B}{\partial \beta} > 0$. Applying implicit function theorem to Eq. (7), we have

$$\frac{\partial f_B^*}{\partial \beta} = -\frac{(X_H - \gamma X_L)\frac{\partial \theta^B}{\partial \beta}}{(X_H - \gamma X_L)\frac{\partial \theta^B}{\partial f_B^*}}. \tag{C.7}$$

Hence higher β supports a smaller stake f_B^* held by the monitoring lender. ■