Renegotiation Costs, Financial Contracting, and Lender Choice

Elia Ferracuti[a,*], Arthur Morris[a]

[a] *David Eccles School of Business, University of Utah*

Abstract

This study presents evidence consistent with incomplete contracting theory in the relationship between renegotiation costs and the initial terms of debt contracts. We exploit plausibly exogenous variation in the taxation of U.S. syndicated loan renegotiation and isolate the effect of changes in renegotiation costs on initial contract terms. We conjecture and find that if contracts are incomplete, then as renegotiation costs fall the maturity of debt contracts lengthens, the likelihood of covenant violation increases, and performance pricing provisions become less common. We also expect and find that this tax change makes private debt more attractive to lenders and borrowers.

Keywords: Renegotiation, Financial Contracting, Lender Choice

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Email addresses: elia.ferracuti@eccles.utah.edu (Elia Ferracuti), arthur.morris@eccles.utah.edu (Arthur Morris)

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1. Introduction

Debt contracts are curiously complex and paradoxically prone to renegotiation (Roberts and Sufi, 2009b, Denis and Wang, 2014, Roberts, 2015). On the one hand, complete contracting theory imagines contracts detailed enough to render renegotiation unnecessary. On the other hand, the Coase theorem argues that simple contracts can be dynamically completed through frequent, costless, and perfectly informed renegotiation (Coase, 1960). Hart and Moore (1988) offer the hybrid explanation that ex-ante allocation of cash flow rights in the loan contract and ex-post reallocation of control rights through renegotiation are used jointly. Rather than to create a complete contract, the multitude of tight covenants observed in practice may be intended as a series of triggers for renegotiation (Garleanu and Zwiebel, 2009). Though debt contracts are an economically meaningful application of this theory, lack of random variation in the design of debt contracts and renegotiation costs has made inference about the relationship between renegotiation costs and initial contract design difficult (Roberts, 2015). Thus, the theory awaits empirical investigation.

The purpose of this paper is to provide empirical evidence on the link between renegotiation costs and initial contract terms. *Internal Revenue Service Bulletin 2012-40: Property Traded on an Established Market* (TD9599) creates variation in renegotiation costs that allows us to isolate renegotiation costs from other determinants of initial debt contract terms. TD9599 reduced the renegotiation costs of U.S.-originated syndicated loans while leaving the renegotiation costs of other non-syndicated loans, and non-U.S. syndicated loans, unchanged.[1] The differential impact of TD9599 on U.S. syndicated loans, other U.S. debt, and non-U.S. syndicated loans provides a setting where we can observe the effect of a change in renegotiation costs on the initial terms of debt contracts holding other determinants of debt contracts constant. Consistent with incomplete contracting, U.S.-originated syndicated loans experience longer maturities, increased likelihood of covenant violation, and decreased reliance on performance pricing provisions relative to both U.S.-originated non-syndicated debt and syndicated debt originated outside the U.S. in the post-TD9599 period. We also find that TD9599 makes private debt more attractive to lenders and borrowers with respect to public debt.

[1] We define non-U.S. loans to be those loans originated outside the United States and granted to borrowers not domiciled in the United States.

Two features of the TD9599 setting are particularly useful in reducing endogeneity concerns. First, TD9599 produces economically significant variation in renegotiation costs (Campello et al., 2016) by reducing the tax burden of renegotiation. As taxes are a major determinant of the choice between renegotiation and bankruptcy (Gilson, 1997), we expect that if renegotiation costs impact initial contract terms, TD9599 should induce an economically significant shift in initial contract terms among U.S. syndicated loans.

Second, adoption of TD9599 is unlikely to impact other determinants of the initial contract terms. While no regulation is truly exogenous, for TD9599 to raise concerns requires a contemporaneous reduction in information asymmetry only between U.S. loan syndicates and their borrowers or a contemporaneous reduction in monitoring costs for U.S. syndicated loans. It is difficult to see how a change in taxation would produce variation in the underlying agency problems that debt contracts are hypothesized to address.

Together, these attributes of TD9599 introduce variation in the renegotiation costs of U.S. syndicated loans without directly impacting agency costs, monitoring costs, and other factors that simultaneously determine initial contract terms.

Our predictions focus on three attributes of loans that determine the frequency of renegotiation: maturity, covenants, and performance pricing provisions. The maturity of the loan contract is a major determinant of the likelihood of renegotiation. Short maturities help lenders mitigate the problems associated with incomplete contracting by making debt less sensitive to changes in firm value and allowing for more frequent repricing of debt (Childs et al., 2005). Moreover, if debt matures before growth options are exercised, the firm's opportunity to deviate from a value-maximizing growth option exercise policy is eliminated (Myers, 1977). The benefits to the lender of shorter maturities, however, impose costs on the borrower. Short-term borrowers are exposed to liquidity risk, i.e., the possibility that the lender will not allow refinancing when needed (Diamond, 1991a, Childs et al., 2005). Issuing new debt also incurs fixed costs that are spread over longer periods when long-term debt is issued. By reducing renegotiation costs while leaving liquidity risk and debt issuance costs unchanged, the tax benefit of renegotiation to lenders under TD9599 makes long-term debt more attractive to lenders. Hence, we expect U.S. loan syndicates and their borrowers to agree on longer maturities in the post-TD9599 period.

Financial covenants are often set tightly and used as "tripwires" to transfer control rights to the lender in situations where the borrower is most likely to misbehave (Smith Jr., 1993,

Dichev and Skinner, 2002). The initial likelihood that covenants will be violated, triggering the reallocation of control rights, depends on the trade-off between the benefits of transferring control and the cost of renegotiation (Garleanu and Zwiebel, 2009). We predict that U.S. loan syndicates and their borrowers will agree to covenants that are more likely to be violated after TD9599 reduces the tax burden of renegotiation.

The third feature of debt contracts that contracting parties can use to deal with the incompleteness of financial contracts is the use of performance pricing provisions (PPPs). PPPs link the interest rate spread of loan debt to the borrower's performance. Interest-decreasing PPPs reduce the spread if credit quality improves. Interest-increasing PPPs increase spreads if credit quality deteriorates. As Asquith et al. (2005) point out, PPPs provide a way to explicitly model the change in loan cost associated with the arrival of new information or occurrence of unanticipated events, reducing the need for future renegotiation. Roberts (2015) partially challenges this view and shows that PPPs do not prevent renegotiation but only delay it. Whether PPPs are intended to delay or avoid renegotiation, a reduction in renegotiation costs reduces the benefits of PPPs, making the inclusion of these features in loan contracts less appealing. We predict that U.S. loan syndicates and their borrowers will use fewer PPPs after TD9599 adoption.

Consistent with our predictions, we find that the change in renegotiation costs around TD9599 leads to changes in the initial terms of U.S. syndicated loans relative to both U.S. single-lender loans and non-U.S. syndicated loans. We find that U.S. syndicated loans increase maturity and the initial likelihood of covenant violation, while including fewer PPPs in debt contracts. Using TD9599 as a shock to renegotiation costs, we find that the maturity of U.S. syndicated loans increases in the post-TD9599 adoption period relative to the maturity of both U.S. single-lender loans and non-U.S. syndicated loans. The increase in maturity appears to be economically meaningful, with maturity rising by 7 to 12 months relative to U.S. single-lender loans, and by 3 to 6 months relative to non-U.S. syndicated loans.

Following TD9599, we also observe an increase in the initial likelihood of covenant violation for U.S. syndicated loans relative to U.S. single-lender loans and non-U.S. syndicated loans. We estimate that the probability of violation for syndicated loans increases between 9 and 19 percentage points relative to U.S. single-lender loans. This change represents a 10 to 20 percent increase with respect to the sample mean. Due to data limitations, we

are unable to estimate probability of violation in our international sample. However, we find an increase in the use of accounting covenants, a key determinant of the probability that a covenant will be violated. We find that U.S. syndicated loans are 7 to 11 percent more likely than non-U.S. syndicated loans to include accounting covenants after TD9599 adoption. This result, however, is not robust to the inclusion of borrower fixed effects.

Consistent with the conjecture that the need to use PPPs to delay renegotiation is decreasing in renegotiation costs, we observe that the use of PPPs in U.S. syndicated loan contracts declines relative to both U.S. single-lender loans and non-U.S. syndicated loans. We estimate economically significant declines between 13 and 19 percent relative to U.S. single-lender loans after TD9599, and between 10 and 16 percent relative to non-U.S. syndicated loans. Consistent with Asquith et al. (2005), we find evidence that this decline is stronger for interest-decreasing PPPs.

In addition to determining ex-ante contract design, renegotiation costs can also influence the borrower's choice between private loans and public bonds. Private and public lenders differ on a number of dimensions: private lenders have better access to information about the borrower, better ability to monitor the borrower, more flexibility in renegotiating the contract terms, and lower cost of renegotiation (Bharath et al., 2008). As far as renegotiation is considered, the lower number of lenders in a private loan setting reduces coordination problems and makes a renegotiation agreement easier to reach. In the case of public debt, any material modification is made nearly impossible by the Trust Indenture Act of 1939, which requires unanimous consent of public bondholders. At the same time, in the pre-TD9599 period, renegotiation of private debt had a larger tax burden than renegotiation of public debt. With the adoption of TD9599, however, the tax disadvantage of syndicated loans is eliminated. If the difference in taxation associated with renegotiations represents a driver in the choice between private and public debt, the adoption of TD9599 is expected to make the choice of private loans relatively more attractive, causing a shift in the capital structure, and in particular in the debt composition, of borrowing firms.

To test our prediction that the adoption of TD9599 makes private debt financing more attractive to firms in pursuit of capital, we perform two tests. First, we study how the likelihood that a firm issues a loan versus a bond changes after TD9599. Using a linear probability model, we observe that the adoption of TD9599 increased the likelihood of issuing a loan versus a bond by about 3 percentage points. Second, we examine the financing

behavior of U.S. and international firms in the pre- and post-TD9599 periods. We predict that firms impacted by TD9599 (U.S. firms) shift their debt structure away from bonds toward loans, relative to their international peers. We estimate the share of U.S. firms' debt that is private debt (loans) to increase by 3 percentage points, while the share of U.S. firms' debt that is public (bonds) falls by 4 percentage points. Both results are consistent with our conjecture that reduced renegotiation costs make private debt more attractive to prospective borrowers.

Using TD9599 and difference-in-differences estimation to isolate the link between renegotiation costs and initial debt contract terms relies on potentially strong assumptions. We take several steps to ensure that the effects we observe are not due to unobserved differences in our treatment and control groups. First, we use two control groups, one that shares institutional setting (U.S. single-lender loans) with the treated group, and one that shares lender structure (non-U.S. syndicated loans). Second, we perform a series of parallel trends and placebo tests and present evidence that the shift in contract terms does not begin before the announcement of TD9599 and is strongest after adoption. Finally, using methods from Oster (2014), we provide evidence that our controls are unlikely to omit problematic correlated variables.

Overall, the paper contributes to the nascent literature on the effects of ex-post renegotiation frictions on ex-ante contract design (Roberts and Sufi, 2009a, Armstrong et al., 2010, Christensen et al., 2016). Our findings are largely consistent with the predictions from the incomplete contracting theory: as costs of renegotiation fall, contracts increasingly rely on renegotiation to dynamically complete the incomplete initial terms. We highlight the important role played by renegotiation, which is seen as an out-of-equilibrium outcome in agency theory, for the efficient design of debt contracts. Our study also informs practice and policy. Contracting parties focus on creating a set of contract terms that give information about the state of the world rather than attempting to anticipate optimal investment choices ex ante. We additionally show that policy-makers influence the way contracts are written when they change the relative attractiveness of the ex-ante allocation of cash flow rights versus the ex-post allocation of decision rights.

The remainder of the paper is organized as follows. Section 2 discusses our theoretical predictions. Section 3 presents our identification strategy. Section 4 studies how renegotiation costs shape ex-ante contract design. Section 5 studies how renegotiation costs influence

lender choice. Section 6 provides evidence on the validity of the identification strategy. Section 7 concludes.

2. Theoretical Predictions

2.1. Ex-ante Contract Design

This section discusses testable predictions for the relationship between renegotiation costs and the initial terms included in a debt contract. Three aspects are investigated: the maturity of the debt contract, the initial likelihood of covenant violation, and the use of performance pricing provisions. We focus on these aspects because, among the various features that can be modified in a debt contract, they are the most likely to have an impact on the likelihood of renegotiation and are therefore expected to change in a predictable way with renegotiation costs.

2.1.1. Debt Maturity

The maturity of a debt contract is one of the attributes that shareholders and debtholders can use to design an efficient contract. Research on debt maturity dates back to Jensen and Meckling (1976) and Myers (1977). Jensen and Meckling (1976) describe the incentive for shareholders to increase the riskiness of the firm after a debt contract has been signed, a phenomenon called *risk shifting*. Myers (1977) shows how introducing debt into a firm's capital structure may lead to *debt overhang,* i.e., the possibility that the firm rejects profitable investment opportunities because part of the associated net present value accrues to debtholders, while the associated costs are faced entirely by shareholders. In both cases, a possible solution to the problem is represented by short debt maturity: if debt matures before the investment opportunity expires, contracting parties can reprice it in an efficient way (Myers, 1977).

The short-term maturity solution, however, does not come for free (Diamond and He, 2014). It is possible to identify two costs to short maturities: liquidity risk and roll-over costs. Liquidity risk represents the possibility that the lender will not allow the borrower to refinance when needed (Diamond, 1991a, Childs et al., 2005). It is possible that the debtholder will force an inefficient liquidation if the need to renew the debt contract arises after the debtholder observes a negative signal. Roll-over costs represent the fixed costs that must be borne when issuing debt. Since short-term debt involves more frequent renewal, it also translates into higher fixed costs.

Shortening debt maturity can represent a valuable instrument in dealing with the incompleteness of contracts as well. When the initial contract is incomplete, the parties are exposed to the risk that the arrival of new information makes the initial terms agreed upon ineffective, which forces a renegotiation.[2] Provided that renegotiation is not costless, the borrower and the lender may prefer a shorter maturity that makes debt less sensitive to changes in firm value and allows for more frequent repricing of debt without having to incur renegotiation costs (Childs et al., 2005).

Overall, the choice between short and long maturity weights the benefits and costs of each solution, included renegotiation costs. We expect to observe that if renegotiation costs decrease while the other benefits and costs remain unchanged, the equilibrium contract shifts toward longer maturities.

2.1.2. Initial Likelihood of Covenant Violation

Maturity is only one of the tools that borrowers and lenders use to deal with the incompleteness of contracts. A second important instrument is represented by financial covenants, and in particular by the likelihood that a financial covenant is violated during the debt contract maturity. Financial covenants are often set tightly and used as "trip-wires" to give lenders control rights in situations where borrowers are most likely to misbehave (Smith Jr., 1993, Dichev and Skinner, 2002). Given that renegotiation is costly, the probability of covenant violation set at contract inception depends on the ease of renegotiation and on the dead-weight losses that the renegotiation process involves (Garleanu and Zwiebel, 2009). A decrease in renegotiation costs makes the dynamic completion of the debt contract through the reallocation of control rights preferable. Therefore, we expect to observe that when renegotiation costs decrease, the equilibrium probability of covenant violation at contract inception increases.

Two papers of which we are aware attempt to study the implications of future renegotiation for ex-ante covenants design. Saavedra (2015) shows that coordination costs in the renegotiation process, as proxied by the number of lenders in the syndicate, affect the inclusion of covenants that restrict the borrower's financial flexibility in the debt contract. Shan et al. (2015) use the advent of credit default swaps (CDSs) as a laboratory to study the impli-

[2] In this respect, Roberts (2015) finds that the number of renegotiation rounds is increasing in the maturity of the loan agreement.

cations of ex-post renegotiation frictions for ex-ante contract design, under the assumption that the introduction of CDSs reduces the importance of control rights to debtholders and should therefore make tight covenants less desirable. Their results are consistent with their prediction and show that covenants loosen after CDSs on the borrower become available. Our paper differs from Saavedra (2015) and Shan et al. (2015) in that we focus on a different source of renegotiation friction, i.e., the tax consequences of renegotiation.

2.1.3. Performance Pricing Provisions

The third tool that borrowers and lenders can use to deal with the incompleteness of contracts is represented by performance pricing provisions (PPPs). Performance pricing provisions are contractual agreements that describe at loan inception how the interest charged on the loan is adjusted as a function of either some financial performance metric or the credit rating of the borrower (Asquith et al., 2005, Manso et al., 2010). This feature makes performance pricing provisions particularly well suited to deal with the impossibility of writing complete contracts.[3] Instead of having to rely on costly renegotiation if/when new information makes the initial terms in the contract ineffective, the parties can agree on how the interest rate charged changes as a function of the evolution of the borrower's performance and riskiness. Performance pricing provisions, however, are not costless. PPPs may represent only a partial solution to the incompleteness of contracts. While the grid agreed upon at inception is expected serve its purpose well on average, there will be unexpected changes in the borrowers' economic condition that will make renegotiation of the terms necessary nevertheless. In support of this possibility, Roberts (2015) shows that PPPs do not prevent renegotiation but merely delay it.

The contracting parties trade off the costs of performance pricing provisions with the benefits of preventing or delaying renegotiation. We expect to observe that when renegotiation becomes less costly, the costs of using PPPs outweigh their benefits at least for some borrowers and lenders and their use in loan contracts becomes less likely.

2.2. Lender Choice

In addition to influencing the initial terms in a debt contract, renegotiation costs are also

[3]The impossibility of writing complete contracts may be caused by the difficulty in foreseeing all possible states of the world, or by the costliness of doing so.

expected to change the equilibrium in the credit market. Campello et al. (2016) argue that lower renegotiation costs increase the lender's expected payoff on new loans, pushing lenders to extend financing to the marginal borrower. An expansion in private lenders' credit supply is not the only expected consequence associated with a reduction in renegotiation costs for private loans. A second consequence is a shift in the equilibrium debt structure of borrowers away from public bonds and towards private loans.

The choice between public and private debt has been investigated both theoretically (Diamond, 1991b, Rajan, 1992, Chemmanur and Fulghieri, 1994, Hackbarth et al., 2007, Morellec et al., 2014) and empirically (Bharath et al., 2008, Denis and Mihov, 2003). This choice matters because of the institutional differences that characterize the two types of lenders. First, banks and bondholders differ in their access to private information: while banks have access to private information both before granting a loan and during the loan term, bondholders make their decisions based mostly on publicly available information.

Second, private lenders have a better ability to monitor the borrower because of the lower number of participants. The ownership of bonds is widely spread, making coordination for monitoring purposes extremely challenging. In contrast, the ownership of syndicated loans is usually concentrated among a limited number of lenders, with one of these lenders coordinating the activity of the participants.

A third difference consists in the flexibility and costs of renegotiating the terms in the contract. As far as flexibility is considered, the large number of bondholders and the requirement by the Trust Indenture Act of 1939 of unanimous consent to make material modifications to bond contracts make renegotiation of bonds problematic. On the cost side, for some time the renegotiation of private debt faced a larger tax burden than the renegotiation of public debt. This difference was eliminated with the adoption of TD9599. If the difference in taxation associated with renegotiations represents a driver in the choice between private and public debt, then if we hold renegotiation costs for public debt constant, we expect to observe that lower renegotiation costs for private debt make private loans relatively more appealing, causing a shift toward private debt in the equilibrium debt structure of borrowers.

3. Identification Strategy

The paper hinges on the ability to identify random variation in renegotiation costs to isolate the effect of renegotiation frictions on the initial terms in the contract and lender

choice. We believe TD9599 serves this purpose well. This section describes TD9599 and the various samples used in the paper to investigate our theoretical predictions.

3.1. TD9599

Debt contracts are determined endogenously and used for different purposes. Lack of random variation in renegotiation costs significantly impairs the ability of the researcher to draw conclusions on the effect that renegotiation costs have on ex-ante contract design (Roberts, 2015). To answer the questions of interest in this paper, ideally we would need to identify a shock to renegotiation costs that possesses two characteristics:

- It has no impact on the determinants of the initial terms in the contract other than through renegotiation costs.
- It has a large enough impact on renegotiation costs to induce the contracting parties to change the initial terms in the contract.

We argue that *Internal Revenue Service Bulletin 2012-40: Property Traded on an Established Market* (TD9599), which significantly modified the tax consequences of out-of-court debt restructuring faced by certain lenders, possesses these characteristics.

Significant[4] out-of-court modifications of debt issues have tax consequences for both the borrower and the lender. The tax consequences of restructuring depend on whether the debt instrument is categorized as publicly traded or private by the IRS.[5] When the debt instrument is characterized as private, the associated tax consequences are based on the difference between the face value of the "new" debt instrument and the face value of the pre-restructuring debt instrument. Given that in practice out-of-court restructuring rarely leads to changes in face value, the difference in face values between the new and old debt is usually zero. Consequently, the borrower can neither recognize any cancellation of debt

[4]The regulation defines a modification as significant when the issue's principal, maturity, timing of interest payment, or yield changes. The evidence in Roberts and Sufi (2009b) suggests that renegotiations trigger modifications of the debt terms that would qualify as significant for tax purposes: renegotiations generate changes relative to the initial maturity, amount, and spread of the contract on the order of 64, 43, and 40 percent, respectively.

[5]Examples of the tax consequences of debt restructuring are provided in Appendix A. For a more thorough discussion of the issue, please refer to Campello et al. (2016).

income (CODI), which would increase its taxable income, nor be granted an equally large tax deduction associated with the original issue discount (OID). At the same time, the original lender facing an economic loss cannot deduct it for tax purposes because the issue price of the debt instrument does not change, while a secondary market buyer pays taxes or receives a tax credit on the phantom gain/loss calculated as the difference between the original face value and the price paid on the secondary market. To summarize, when a debt instrument is considered private for renegotiation purposes, the renegotiation is in most cases tax neutral for both parties.

When the debt instrument is instead characterized as publicly traded, the tax consequences of restructuring are based on the difference between the fair market value of the renegotiated debt and the debt's original face value. The borrower recognizes CODI in an amount equal to the difference between the new issue price and the original face value, increasing its taxable income. However, the higher taxable income is likely to have no effect on the taxes paid by the borrower because (1) the borrower also benefits from an OID of an equal amount, and (2) borrowers restructuring debt usually have very low marginal tax rates.[6] From the original lender's perspective, restructuring leads to the recognition of the economic loss for tax purposes, lowering taxable income.[7] Secondary market buyers instead pay taxes or are granted a tax deduction on the phantom gain/loss calculated as the difference between the fair market value of the new instrument, which is likely to be lower than the original face value, and the price they paid on the secondary market. To summarize, when a debt instrument is considered public for renegotiation purposes, the renegotiation is usually tax neutral for the borrower, but it produces tax benefits for the lender.

A consequence of the differential tax treatment of private and publicly traded debt instruments in out-of-court restructuring is that, while restructuring is at best tax-neutral for private debt instruments, it can lead to significant tax savings for the lenders and little to no additional taxes for the borrower when the debt instrument qualifies as public. Therefore, debt renegotiation is less costly when the debt instrument qualifies as public.

The introduction of TD9599 by the IRS on September 12, 2012 modified the tax con-

[6] Campello et al. (2016) find that, in their sample, the marginal tax rate of distressed firms is about 4 percent.

[7] Campello et al. (2016) show that, at least in their sample, lenders usually have a marginal tax rate of 35 percent. Hence, the recognition of losses for tax purposes can lead to significant tax savings.

sequences of out-of-court restructuring by changing the conditions a debt instrument must meet to qualify as publicly traded for renegotiation purposes. Before TD9599, a debt instrument qualified as publicly traded if (1) the issue was listed on a security exchange or traded in a market, or (2) the issue's price appeared in a quotation medium, or (3) a price quote could be obtained from dealers or traders. These conditions precluded all private loans from being classified as publicly traded. With TD9599, a fourth condition was added: the availability of a "soft quote" from a broker, dealer, or pricing service suffices to classify a debt instrument as public. This amendment opened the door for private loans traded in the secondary market to qualify as publicly traded for renegotiation purposes.

As described in Campello et al. (2016), a large number of syndicated - but not single lender - loans were reclassified from private to public debt. Moreover, international loans, i.e., loans syndicated outside of the United States and issued to borrowers headquartered outside of the United States, were not affected by TD9599. We exploit this asymmetric effect of TD9599 on U.S. syndicated loans, U.S. single-lender loans, and international syndicated loans to study how changes in renegotiation costs affect the initial terms in the contract. Specifically, we use a difference-in-differences framework to study how the initial terms in the contract adopted in syndicated U.S. loans changed after TD9599, using single-lender U.S. loans and syndicated international loans as control samples. The within-U.S. analysis, which compares syndicated and single lender U.S. loans, enables us to hold the institutional environment constant but compares two potentially different types of loans. The international syndicated loans analysis enables us to compare two identical instruments, i.e., syndicated loans, but suffers from possible institutional-environment differences between treated and control loans. Combining the two analyses reduces concerns that our results are driven by either loan type differences or institutional-environment differences: for results to be consistent across the two samples but due to unobserved heterogeneity, the bias in the tests would have to affect single-lender U.S. loans and syndicated international loans in the same way, but leave syndicated U.S. loans unaffected.

The shock to renegotiation costs associated with TD9599 seems to broadly meet the two conditions listed at the beginning of the section. On the one hand, variation in renegotiation costs introduced by TD9599 appears exogenous to the other determinants of ex-ante security design. For example, there are no obvious reasons that TD9599 would be associated with changes in information asymmetry between the borrower and the lender differently

for syndicated and single lender or international loans. It is then difficult to envision how TD9599 would change the average adverse selection problem faced by lenders in the private debt market. Moreover, the absolute costs of monitoring faced by lenders to prevent moral hazard on the borrower's side should also be unaffected by TD9599, which reduces the likelihood that observed modifications to the initial terms of the contracts are driven by changes in the underlying agency problem that are specific to U.S. syndicated loans. On the other hand, the effect of TD9599 on renegotiation costs appears to be economically important: Campello et al. (2016) estimate that the aggregate reduction in expected renegotiation costs to affected loans amounts is approximately $100 billion.

3.2. Sample Description

To test our theoretical predictions about the relationship between renegotiation costs and initial contract terms, we assemble a dataset of initial contract terms and loan features from a number of sources. We begin by gathering all loan facilities reported in the Loan Pricing Corporation (LPC) DealScan database that are (1) issued by non-financial firms during the sample period (2005-2014) and (2) either syndicated in the United States and granted to U.S. borrowers, or syndicated outside of the United States and granted to non-U.S. borrowers. Our sample period centers on 2010, when TD9599 was announced, and provides us with 5 pre-announcement calendar years and 4 post-announcement calendar years. We aggregate loan-facility-level data to the loan-package-level data for the maturity and covenant analyses, while the performance pricing provision analysis is based on facility-level data.

We obtain data on borrower fundamentals for the U.S. sample[8] from Compustat. Traditionally, papers in this area have relied on the linking table created by Sudheer Chava and Micheal Roberts (Chava and Roberts, 2008) and distributed by the Wharton Research Data System. This linking table, however, ends in 2012, the year that TD9599 was enacted. We extend the Chava and Roberts linking table to 2014 using a 3-step algorithm. First, we search Compustat for GVKEYs identified by Chava and Roberts that remain active in the

[8]We do not have access to the same information for our sample of international borrowers. However, the enlarged sample that characterizes the international control group enables us to use borrower fixed effects in the international sample analysis, which reduces concerns that the results are driven by systematic differences between U.S. and international borrowers.

2012 period. Second, we use a Python token-matching script to identify candidate matches based on borrower names as reported in DealScan and Compustat. This matching script produces a confidence statistic, which we use to tag suspect matches. Third, we verify he suspect matches by hand.

The purpose of linking firm fundamentals from Compustat with loan data from DealScan is to control for the attributes of the borrower at the time the loan is negotiated. In practice, making this link requires assumptions about the negotiation process. Following Murfin (2012), we report the contracting date of a loan as 90 days prior to the DealScan reported date, i.e., one month prior to receiving a mandate and two months into the syndication/documentation process. After linking DealScan and Compustat, we require that the loan package report covenant data and have non-missing values for Compustat controls: capital expenditure (CAPEX), leverage (LEV), market-to-book ratio (MTB), return on assets (ROA), size (SIZE), tangibility (TANG), and Z-score (ZSCORE). All variables are defined in Appendix A. The final DealScan sample includes 13,296 loan packages, of which 3,154 are syndicated loans syndicated in the U.S. to U.S. borrowers, 368 are single-lender loans syndicated in the U.S. to U.S. borrowers, and 8,216 are syndicated loans syndicated outside of the U.S. to non-U.S. borrowers. Descriptive statistics, reported in Table 1, Panel A, are generally consistent with prior literature.

Table 1, Panel B presents descriptive statistics for the within-U.S. analysis separately for syndicated and single-lender loans. Single-lender loans have shorter maturities, a higher probability of covenant violation, fewer performance pricing provisions, and larger spreads. They are more likely to be secured and include more financial covenants, more dividend covenants, more capital expenditure covenants, and about the same number of sweeps. Single-lender borrowers tend to be smaller and slightly less levered, and they have higher market-to-book and lower ROA. Our main analyses investigate the differences across subsamples in these changes from the pre-TD9599 period to the post-TD9599 period. Similarly, Table 1, Panel C presents pre- and post-TD9599 descriptives for each of the syndicated and single-lender U.S. loan sub-samples.

Table 1, Panel D presents descriptive statistics for the international analysis separately for syndicated U.S. and international loans. International loans have slightly shorter maturities, fewer accounting covenants, fewer performance pricing provisions, and smaller spreads. They are less likely to be secured and include fewer dividend covenants, capital expenditure

covenants, and sweeps. Our main analyses investigate the differences across sub-samples in these changes from the pre-TD9599 period to the post-TD9599 period. Similarly, Table 1, Panel E presents pre- and post-TD9599 descriptives for each of the syndicated U.S. and international loan sub-samples.

To test our hypothesis that TD9599 makes loans more attractive than bonds, we compare (1) the likelihood that a borrower issues a private loan versus a bond in a U.S.-only sub-sample and (2) the change in capital structure, in terms of proportion of loans and bonds in a borrower's debt position, between U.S. and non-U.S. firms after the adoption of TD9599 in the United States. We collect capital structure and firm headquarters data from CapitalIQ. Table 1, Panel F reports descriptive statistics for the resulting CapitalIQ dataset, split between U.S. and non-U.S. firms. U.S. firms appear to frequent bond markets slightly more than their non-U.S. counterparts and issue more secured debt. Table 1, Panel G presents pre- and post-TD9599 descriptives for each of the U.S. and non-U.S. firm sub-samples. We use these sub-samples in our lender choice analysis.

4. Ex-ante Contract Design

This section studies the implications of renegotiation costs for the initial terms included in a debt contract. Three aspects are investigated: the maturity of the debt contract, the initial likelihood of covenant violation, and the use of performance pricing provisions. Overall, we find that the initial terms in a debt contract are adjusted as renegotiation cost decreases with TD9599: debt maturity increases, and so do the initial likelihood of covenant violation and the likelihood that a covenant is included in the loan contract, while the inclusion of performance pricing provisions declines.

4.1. Debt Maturity

We conjecture that if renegotiation costs decrease while the other benefits and costs of the maturity choice remain unchanged, the equilibrium contract shifts toward longer maturities. We test our conjecture using a difference-in-differences framework that compares the maturity of treated (i.e., syndicated U.S.) versus untreated (i.e., single-lender U.S. and syndicated international) loan contracts in the pre- and post-TD9599 adoption period.

We use the following regression specification to test our conjecture:

$$\begin{aligned} Maturity &= \alpha + \beta_1 Treated * POST + \beta_2 Treated + \\ &\quad \beta_3 POST + \sum \gamma Control + \epsilon \end{aligned} \tag{1}$$

Maturity represents the maturity of the loan contract expressed in months. *Treated* represents two alternative variables: (1) *Syndicated*, an indicator variable equal to one if the observation is a syndicated U.S. loan, zero if it is a single-lender U.S. loan; or (2) *US*, an indicator variable equal to one if the observation is a syndicated U.S. loan, zero if it is a syndicated international loan. *POST* is an indicator variable equal to one in the post-TD9599 adoption period (i.e., after September 2012), zero in the pre-TD9599 adoption period. The specification includes a wide array of loan controls for both sub-samples: *Spread*, the debt contract spread; *log($ Loan),* the logarithm of the amount issued; *Secured,* an indicator variable equal to one if the loan is secured, zero otherwise; *% Lead,* a variable describing how much of the loan amount is allocated to the lead arranger; *PPP,* an indicator variable equal to one if the loan has a performance pricing provision, zero otherwise; *# Acc. Cov.,* a variable counting the number of financial covenants included in the loan agreement; *Div. Cov.,* an indicator equal to one if the loan agreement includes a dividend covenant, zero otherwise; *CAPEX Cov.,* an indicator variable equal to one if the loan agreement includes an investment covenant, zero otherwise; and *# Sweeps,* a count variable identifying the number of sweeps included in the loan agreement. The within-U.S. analysis also includes borrower-specific controls: *CAPEX,* computed as capital expenditures scaled by total assets; *LEV*, calculated as short- and long-term debt over total assets; *MTB,* defined as the market value of equity over its book value; *ROA*, computed as net income over total assets; *SIZE,* the natural logarithm of the market value of equity; *TANG,* defined as the ratio of property, plants, and equipment over total assets; and *Z_SCORE,* calculated as in Altman (1968); the interaction between each control and the *POST* variable; and industry and rating fixed effects. The international analysis does not enable us to use borrower-level controls. However, the larger number of borrowers in the control group enables us to use borrower fixed effects, which capture borrower-specific time-invariant unobserved heterogeneity. In both estimations, standard errors are clustered at borrower and year level.

The coefficient of interest is represented by β_1, which describes how the difference in loan

maturity between the treated and control groups changes after the adoption of TD9599.

Table 2, Panel A reports results from estimating equation 1 for the within-U.S. sample. We use four specifications to assess the consistency of results. The first specification, reported in Column 1, does not include controls. The second specification (Column 2) introduced controls, while the third specification (Column 3) introduces controls and the interaction between those controls and the *POST* variable to account for changes in loan and borrower characteristics induced by TD9599. Finally, Column 4 reports results from estimating the equation on a restricted sample where the period between the announcement and the adoption of the regulation is dropped. Results confirm our conjecture and consistently show that maturity increased in the post-TD9599 period: in all cases the coefficient of interest is statistically significant (at the 5 percent or 1 percent level). Moreover, the magnitude of the coefficient is also economically meaningful, with the difference in maturity between syndicated U.S. loans and single-lender U.S. loans increasing by about 12 months, a 23-percentage-points increase relative to the sample mean.

Table 2, Panel B reports results from estimating equation 1 for the international sample. We use six specifications to assess the consistency of results. The first specification, reported in Column 1, does not include controls. The second specification (Column 2) introduces controls, while the third specification (Column 3) introduces controls and is estimated on a restricted sample that excludes the period between the announcement and the adoption of the regulation. Columns 4 to 6 follow the same structure but also expand the model to include borrower firm effects. In all cases, the coefficient of interest is statistically significant (from 1 percent to 10 percent significance level). Furthermore, the effect appears relevant from an economic magnitude perspective as well, with the difference in maturity between syndicated U.S. loans and syndicated international loans increasing by about 6 months, a 12-percentage-point increase relative to the sample mean.

Overall, our analyses suggest that lower renegotiation costs increase the equilibrium debt contract maturity. This finding is consistent with our expectations and with the incomplete contracting theory. Specifically, there is a statistically and economically meaningful increase in debt maturity when renegotiation costs decrease, a result expected if incomplete contracting theory holds true in the data.

4.2. Initial Likelihood of Covenant Violation

We conjecture that if renegotiation costs decrease while the other benefits and costs

associated with the use of financial covenants remain unchanged, the equilibrium initial likelihood of covenant violation shifts toward higher probabilities. We test this conjecture using a difference-in-differences framework that compares the initial likelihood of covenant violation of treated (i.e., syndicated U.S.) versus untreated (i.e., single lender U.S.) loan contracts in the pre- and post-TD9599 adoption period. Lack of detail in the financial statements prevents us from using the initial likelihood of covenant violation in combination with international syndicated loans. For this reason, we replace the initial likelihood of covenant violation with the likelihood that a financial covenant is included in the loan contract, under the observation that covenants-induced renegotiations are possible only when a financial covenant is included.

We use the following regression specification to test our conjecture:

$$\begin{aligned} PV &= \alpha + \beta_1 Treated * POST + \beta_2 Treated + \\ &\quad \beta_3 POST + \sum \gamma Control + \epsilon \end{aligned} \tag{2}$$

PV represents a proxy for the initial probability of violation implicit in the loan contract. We measure PV in two ways. The first proxy *(PVIOL)* comes from Demerjian and Owens (2015). We follow their methodology and estimate the likelihood that at least one covenant in the loan contract will be violated during the first year of maturity. This proxy has the advantage of capturing the various determinants of covenant violation, i.e., the number of covenants, the initial distance from the performance threshold, the volatility in the underlying performance metric, and the covariance between the various performance metrics included. The second proxy we use *(Acc. Cov.)* is defined as one if a financial covenant is included in the loan agreement, zero otherwise. This proxy considers only whether an accounting covenant is included, and it is therefore expected to capture the underlying construct of interest, i.e. the initial likelihood of covenant violation, with error, reducing the power of the tests (Demerjian and Owens, 2015). *Treated* represents two alternative variables: (1) *Syndicated*, an indicator variable equal to one if the observation is a syndicated U.S. loan, zero if it is a single-lender U.S. loan; or (2) *US*, an indicator variable equal to one if the observation is a syndicated U.S. loan, zero if it is a syndicated international loan. *POST* is an indicator variable equal to one in the post-TD9599 adoption period (i.e., after

September 2012), zero in the pre-TD9599 adoption period. The specification includes the same set of loan controls and borrower-specific controls included in equation 1, with the only difference being the exclusion of the number of financial covenants and the inclusion of *Maturity,* i.e., the loan maturity measured in months. Standard errors are clustered at the borrower and year level.

The coefficient of interest is represented by β_1, which describes how the difference in the initial likelihood of covenant violation (or the likelihood that a covenant is included in the loan contract) between the treated and control groups changes after the adoption of TD9599.

Table 3, Panel A reports results from estimating equation 2 using the within-U.S. sample. Results fully support our conjecture: the coefficient of interest is positive and statistically significant at the 5 percent or 10 percent level. The coefficient is also economically important: when the whole battery of controls and interactions is considered, for example, the coefficient is 0.09, representing a 9-percentage-point increase relative to the sample mean.

Table 3, Panel B reports results from estimating equation 2 using the international sample. Results show that the likelihood that the treatment group includes a financial covenant in the loan contract increases in the post-TD9599 period. The coefficient of interest is positive and statistically significant (at either the 5 percent or 1 percent level) in all specifications without borrower fixed effects. The result, however, is not robust to the inclusions of borrower fixed effects.

Overall, the results suggest that renegotiation costs influence the initial likelihood of covenant violation, as predicted in Garleanu and Zwiebel (2009).

4.3. Performance Pricing Provisions

We conjecture that if renegotiation costs decrease while the other benefits and costs associated with the use of performance pricing provisions remain unchanged, the equilibrium likelihood that a performance pricing provision is included in the loan contract shifts toward lower probabilities.

We test our prediction using the following linear probability model, run over the two samples evaluated at the facility level:

$$\begin{aligned} PPP &= \alpha + \beta_1 Treated * POST + \beta_2 Treated + \\ &\quad \beta_3 POST + \sum_{20} \gamma Controls + \epsilon \end{aligned} \tag{3}$$

PPP is an indicator variable equal to one if the loan facility includes a performance pricing provision, zero otherwise. *Treated* represents two alternative variables: (1) *Syndicated*, an indicator variable equal to one if the observation is a syndicated U.S. loan, zero if it is a single-lender U.S. loan; or (2) *US*, an indicator variable equal to one if the observation is a syndicated U.S. loan, zero if it is a syndicated international loan. *POST* is an indicator variable equal to one in the post-TD9599 adoption period (i.e., after September 2012), zero in the pre-TD9599 adoption period. The specification includes the same controls considered in previous tests, plus the additional determinants of PPPs identified in Asquith et al. (2005) when the within-U.S. sample is used[9]: *PROB_PREPAY,* constructed from five years of historical data collected by Moody's in an average rating transition matrix (2008) as the sum of the probability of a credit upgrade and the probability that the debt is withdrawn; *PROB_DOWN*, constructed as the probability that the borrower's credit quality will decline but not default using Moody's rating transition matrix (2008); *VolCreditSpread,* calculated as the annual variance of spreads for a given risk class for firms included in DealScan; *ExpVolRet,* defined as the average standard deviation of return for the firm's industry measured at the SIC two-digit level in the year prior to loan initiation, multiplied by loan maturity; *Predictability,* calculated as described in Asquith et al. (2005, p. 115); *Revolver,* an indicator variable equal to one if the loan is revolving, zero otherwise; and *TakeOver,* an indicator variable equal to one if the loan is used for a merger or acquisition, zero otherwise.

The coefficient of interest is represented by β_1, which describes how the difference in the likelihood that a PPP is included in the loan agreement between the treated and control groups changes after the adoption of TD9599.

Table 4, Panel A reports the coefficients resulting from estimating equation 3 for the within U.S. loan sample. In all cases, the coefficient of interest is negative and statistically significant, consistent with our conjecture. The coefficient is economically large too, representing a 27 to 40 percent reduction i the use of PPPs in the sample.

Table 4, Panel B reports the coefficients resulting from estimating equation 3 for the international loan sample. As in the within U.S. loan sample, the coefficient of interest is always negative and statistically significant, consistent with our conjecture. The coefficient

[9]We do not have access to the necessary information to compute these variables for the international loan sample.

is economically large too, and of similar magnitude to that of the within-U.S. analysis.

Overall, these results suggest that the likelihood that performance pricing provisions are included in a loan contract changes as a function of renegotiation costs in the direction predicted by incomplete contracting theory.

4.4. Additional Analyses

We run a series of additional analyses using alternative outcome variables and/or control groups to provide further support to our main findings.

First, we test the maturity prediction using an alternative control group, i.e., public bonds issued in the U.S. We conjecture that the adoption of TD9599 translates into a longer maturity for syndicated U.S. loans than for public bonds. In untabulated results, we find that the coefficient of interest is positive and statistically significant in the specification that includes controls and interactions, consistent with the equilibrium maturity of treated debt instruments increasing in the post-TD9599 period.

Second, we test the likelihood of covenant violation prediction using the number of accounting covenants included in the contract as the outcome variable, and single-lender U.S. loans and public bonds as control groups, respectively. The single-lender U.S. loans analysis confirms our main results in that the coefficient of interest is in all cases positive and statistically significant, as expected. In contrast, the public bonds analysis produces results that are inconsistent with our prediction.

Finally, we expand our performance pricing provision analysis to take into consideration that PPPs can take two alternative forms: interest increasing and interest decreasing. Interest-increasing PPPs allow the interest rate charged on a loan to increase when the borrower's creditworthiness declines; interest-decreasing PPPs automatically decrease the interest rate on a loan when the borrower's creditworthiness improves (Asquith et al., 2005). Asquith et al. (2005) conjecture and find that the two mechanisms solve different problems in the borrower-lender relationship: while interest-increasing PPPs are used to deal with adverse selection and moral hazard, interest-decreasing PPPs are more common when the costs of renegotiation, likelihood of prepayment, and adverse selection are greater.

If Asquith et al. (2005) are right in their argument that interest-decreasing PPPs are associated with renegotiation costs while interest-increasing PPPs are not, and if the incomplete contracting theory is correct in that renegotiation costs matter in the definition of the initial terms in the contract, then the effect of the adoption of TD9599 should be stronger

for interest-decreasing PPPs. We test this conjecture using a modified version of equation 3: the model uses interest-increasing (interest-decreasing) PPPs as the outcome variable, while controlling for interest-decreasing (interest-increasing) PPPs. The additional control is necessary because once the borrower agrees to include one form of performance pricing provision, the cost to include the other one is reduced.

Our untabulated test shows that Asquith et al. (2005)'s conjecture holds true in the within-U.S. analysis: the coefficient of interest is negative and statistically significant for interest-decreasing PPPs, but not statistically different from zero for interest-increasing PPPs. In the international loans analysis, however, the likelihood of including either type of performance pricing provision declines to a similar extent.[10]

5. Lender Choice

This section studies the implications of renegotiation costs for the borrower's choice of lender. Two aspects are investigated: the change in the likelihood that a borrower issues a private loan versus a public bond as renegotiation costs change, and the change in the debt structure composition that U.S. borrowers hold when compared to their international counterparts as renegotiation costs change. Overall, we find that the likelihood of issuing loans over bonds increases in the post TD9599 adoption period. Moreover, U.S. borrowers (i.e. the treated group) increase the weight of loans and decrease the weight of bonds in their debt structure more than their international peers (i.e. the untreated group) in the post TD9599 adoption period. Both results suggest that borrowers shift toward private loans as renegotiation costs decrease.

5.1. Bonds versus Loans

We conjecture that the likelihood that a borrower issues a loan instead of a bond increases as renegotiation costs decrease. We test our prediction using the following linear probability model:

$$LOAN \quad = \quad \alpha + \beta_1 POST + \beta_2 AQ + \beta_3 LEV + \beta_4 MTB$$

[10] While the coefficient on interest-decreasing PPPs is larger, the difference between the two coefficients is not statistically different from zero, with a p-value of 0.25.

$$+\beta_5 SIZE + \beta_6 TANG + \beta_7 ZSCORE +$$
$$+IndustryFE + RatingFE + YearFE + \epsilon \quad (4)$$

$LOAN$ is an indicator variable equal to one if the borrower issues a loan, zero if the borrower issues a bond. $POST$ is an indicator variable equal to one in the post-TD9599 adoption period (i.e., after September 2012), zero in the pre-TD9599 adoption period. AQ represents discretionary accruals. The variable is multiplied by negative one to be consistent with the definition of accounting quality in Bharath et al. (2008); LEV is calculated as short- and long-term debt over total assets; MTB is defined as the market value of equity over its book value; $SIZE$ is the natural logarithm of the market value of equity; $TANG$ is the ratio of property, plans, and equipment over total assets; and Z_SCORE is defined as in Altman (1968). The specification also includes industry, rating, and year fixed effects, while standard errors are clustered at the borrower and year level.

The coefficient of interest is β_1, which describes how the likelihood of choosing a loan over a bond changes after the adoption of TD9599. The model is estimated over the whole sample and over a sub-sample that includes only firms existing in both the pre and post TD9599 period. The sub-sample is used to reduce concerns that results are driven by banks expanding their credit supply to the marginal borrower instead of borrowers shifting toward private loans.

Table 5, Panel A reports the coefficients resulting from estimating equation 4 on the whole sample (Columns 1 and 2) and over the reduced sample (Columns 3 and 4). In all cases the coefficient of interest is positive and statistically significant at the 1 percent level, suggesting that the likelihood of choosing a loan over a bond increases by about 3 percentage points in the post-TD9599 period. We assess the robustness of the results to the inclusion of borrower fixed effects (untabulated) and observe the same trend, which suggests that unobserved time-invariant heterogeneity is not driving the finding.

5.2. Capital Structure Composition

We conjecture that the debt structure of borrowers shifts toward loans versus bonds as renegotiation costs decrease. We test our conjecture through the following regressions specification:

$$
\begin{aligned}
\%Loans &= \alpha + \beta_1 US * POST + \beta_2 POST + \\
&+ \sum \gamma Controls + \sum \delta Controls * POST + \\
&+ BorrowerFE + \epsilon
\end{aligned} \tag{5}
$$

$$
\begin{aligned}
\%Bonds &= \alpha + \beta_1 US * POST + \beta_2 POST + \\
&+ \sum \gamma Controls + \sum \delta Controls * POST + \\
&+ BorrowerFE + \epsilon
\end{aligned} \tag{6}
$$

%Loans is calculated as outstanding loans over total debt, while *%Bonds* represents outstanding bonds over total debt. *US* is a dummy variable equal to one for U.S. borrowers (the treated group), zero for international borrowers (the control group). *POST* is an indicator variable equal to one in the post-TD9599 adoption period (i.e., after September 2012), zero in the pre-TD9599 adoption period. Both equations include the following controls: *SECUREDPCT,* the percentage of debt secured; *SENIORPCT,* the percent of debt that is senior; *REVOLVINGPCT,* the percentage of debt that is revolving; and *DEBTEBITDA,* the debt to ebitda ratio that the firm achieved during the fiscal year. The specification also includes borrower fixed effects, while standard errors are clustered at the borrower and year level.

The coefficient of interest is represented by β_1. In the *%LOAN* regression, we expect it to be positive, indicating that the treated group increases the weight of loans in the debt structure more than the untreated group in the post-TD9599 period. In the *%BONDS* regression, we expect the relationship to flip, indicating that the treated group decreases the weight of bonds in the debt structure more than the control group in the post-TD9599 period.

Table 5, Panel B reports results from estimating equation 5. Results are consistent with the expectation in that the coefficient of interest is positive and statistically significant at the 10 percent level. The magnitude of the coefficient suggests that the difference between the percentage of loans composing U.S. and international borrowers' debt structure increases

in the post period by about 0.03, an 8.7 percent increase with respect to the sample mean.

Table 5, Panel C reports results from estimating equation 6. Results are consistent with the expectation in that the coefficient of interest is negative and statistically significant at the 5 percent level. The magnitude of the coefficient suggests that the difference between the percentage of bonds composing U.S. and international borrowers' debt structure decreases in the post period by about 0.04, an 8 percent decrease with respect to the sample mean.

6. Validity of the Identification Strategy

In this section, we test whether the identifying assumption behind our identification strategy finds support in the data. We do so in three ways. First, we test whether the parallel trend assumption, crucial in a difference-in-differences setting, holds true. Second, we use a placebo test to assess the likelihood that our findings are spurious. Third and last, we use Oster (2014)'s approach to identify the relationship, in terms of magnitude and sign, that would need to exist between explained and unexplained variation to eliminate our findings. While we acknowledge that the validation of our empirical approach is by no mean perfect, we consider the consistency in results across alternative approaches to be at least indicative that the validity of the testable assumption behind the use of difference-in-differences finds reasonable support in our setting.

6.1. Parallel Trend Assumption

Our identification strategy leans heavily on the assumption that syndicated U.S. loans would have had parallel trends in initial contract terms to single lender U.S. loans and syndicated international loans if TD9599 had not been announced and adopted in 2012. We verify the validity of the parallel trend assumption in two ways. First, we plot the time trend in maturity, initial likelihood of covenant violation, inclusion of a financial covenant, and performance pricing provisions separately for the treatment and control groups over time. This test enables us to sense whether the variable of interest is moving similarly in the two samples.

This methodology does not account for potential changes in other determinants of the initial terms in the contract over time. For this reason, we also follow Christensen et al. (2015) and examine pre-TD9599 trends by testing for treatment effects in each year included in our sample periods. We repeat our linear regression analyses estimating an annual treatment effect relative to the benchmark year of 2010. This analysis also enables us to reduce concerns

that our results are driven by the relatively long time window selected by providing an estimate of the main effect between the year before the announcement and the year in which TD9599 was adopted.

Panel A of Figures 1, 2, 3, and 4 plots the outcome variables by year and suggests the existence of an acceptable parallel trend in the pre-TD9599 period. Panel B of the same figures plots the results of following Christensen et al. (2015)'s approach for our main specifications. Inspection of these plots does not reveal any significant treatment effect in the direction of our predictions until after the announcement of TD9599.

We conclude that the parallel trend assumption holds relatively well in the data.

6.2. Placebo Test

To further support the validity of our empirical design, we supplement the parallel trend assumption analysis with a placebo test that attempts to replicate the main findings using a randomly selected adoption date in the pre-TD9599 adoption period.

The process works as follows. First, we assign a random adoption date to a restricted sample that runs from 2006 to 2010, i.e., before the announcement of TD9599. Second, we run the regression specification for the various analyses using the newly created adoption date and the associated interactions. Third, we save the coefficient on the difference-in-differences estimator and the associated standard error. Fourth, we replicate the process 100 times. Finally, we analyze how often in these replications the estimated coefficient is consistent with our predictions. Failing to find results consistent with expectations in the placebo analysis further supports the argument that the parallel trend assumption performs relatively well in the data.

When looking at the maturity analysis, we fail to find support for our hypotheses in 99 percent of the replications when using single-lender U.S. loans as control group and 75 percent of the replications when using syndicated international loans as controls. Results on the initial likelihood of covenant violation analysis are insignificant in 99 percent of the the replications, while results on the likelihood that a financial covenant is included in the loan contract are insignificant in 95 percent of the cases. As far as PPPs are considered, 95 percent of the replications are insignificant for the within U.S. analysis, and 99 percent of the replications fail to produce results consistent with our conjecture when we use the international loans sample as control group. Finally, when looking at *%Loans* and *%Bonds, we find that* the placebo produces insignificant results in 99 percent of the cases.

In summary, the placebo test supports the use of TD9599 as a plausibly exogenous shock to renegotiation costs.

6.3. The Oster (2014) Test

We use the Oster (2014) test as a third assessment of the validity of our identification strategy. Oster (2014) develops an approach based on the intuition that the bias arising from the observed controls is informative about the bias that arises from the full set including the unobserved components. We focus our attention on the estimation of δ, i.e., the ratio of selection on unobservables relative to observables that would be necessary to explain away our results.[11]

Results for maturity show that the degree of selection on unobservables needed to drive away results would be more than three times the selection on observables. Moreover, the correlation between selection on observables and selection on unobservables in the within-U.S.-loans analysis would also need to be negative, while in most cases this relationship is reasonably assumed to be positive.

Results are weaker when the likelihood of covenant violation is considered. In the within-U.S. analysis, δ is approximately 53 percent, indicating that the degree of selection on unobservables needed to drive away results is approximately half as large as the degree of selection on observables. Given the estimation error associated with PVIOL, the dependent variable, the lower delta is expected because of the lower overall ability of the researcher to explain the outcome variable's variation. In the international loans analysis, δ is approximately negative 13 percent. While the coefficient magnitude indicates that even a relatively unimportant degree of unobserved heterogeneity would drive away the finding, the negative correlation reduces this concern to the extent that in most cases the relationship is expected to be positive.

Results are fully robust when performance pricing provisions are considered. The δ resulting from the within-U.S.-loans analysis is large (about 27) and negative, while the δ resulting from the international loans analysis is equal to approximately 3. In both cases, the likelihood that failure to control for selection on unobserved heterogeneity explains the

[11] The calculation of δ requires an assumption about R^2_{Max}, i.e., the amount of variation explained if all controls could be observed. We follow Oster (2014) and set R^2_{Max} to be equal to 130 percent of the R-squared associated with the model that includes all observable controls.

main findings appears limited.

Finally, the results for *%Loans* and *%Bonds* show that even in these analyses, the risk that results are driven by selection on unobserved heterogeneity is small, with deltas of 14 and 22, respectively.

Overall, we believe that the results from applying the Oster (2014) test further reduce concerns that the main findings are spurious in nature.

7. Conclusion

Debt contracts provide a rich laboratory in which to study contracting theory, and at the same time are economically important in their own right. However, debt contracts regulate complex systems and are simultaneously shaped by incomplete information, monitoring costs, renegotiation costs, and macroeconomic conditions. We use the adoption of TD9599 to investigate the relationship between renegotiation costs and initial contract terms. In this setting, we are able both to characterize the relationship between renegotiation costs and initial debt contract terms, and to show that debt covenants are used to trigger reallocation of control rights.

Our tests show that there is a negative relationship between renegotiation costs and both the initial time to maturity and the initial probability of covenant violation, but there is a positive relationship between renegotiation costs and use of performance pricing provisions. Consistent with the incomplete contracting theory, it appears that borrowers and lenders define initial debt contracts with ex-post renegotiation frictions in mind. This finding rationalizes the tension between debt contract complexity, which is suggestive of complete contracting, and frequent renegotiations, which are suggestive of incomplete contracts dynamically completed through renegotiation. We also find that TD9599 makes private debt financing more attractive than public debt financing. These results are robust to controlling – to the extent possible with archival data – for the agency concerns and firm characteristics that determine lender choice and capital structure.

While there is much work to be done on the questions addressed in this paper, our work provides the first evidence that lower renegotiation costs shift the equilibrium debt contract and debt structure. This finding is important for policy makers and practitioners, as it suggests that policies that reduce renegotiation costs are not neutral: they affect the way debt contracts are set up and influence borrowers' choices in the credit market.

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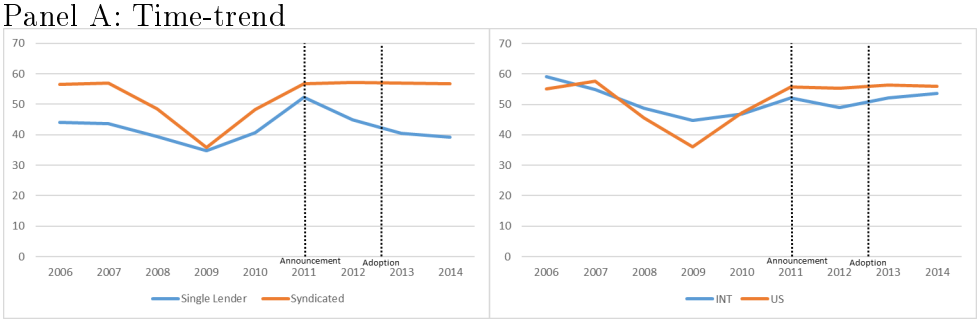
Figures

Figure 1: Maturity

Panel A: Time-trend



Panel B: Year Regression Coefficients

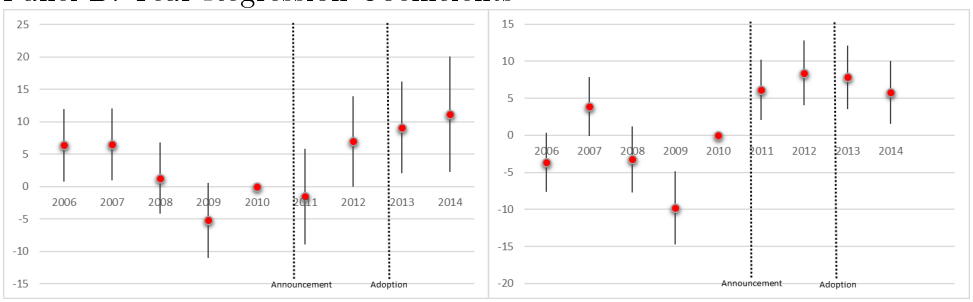
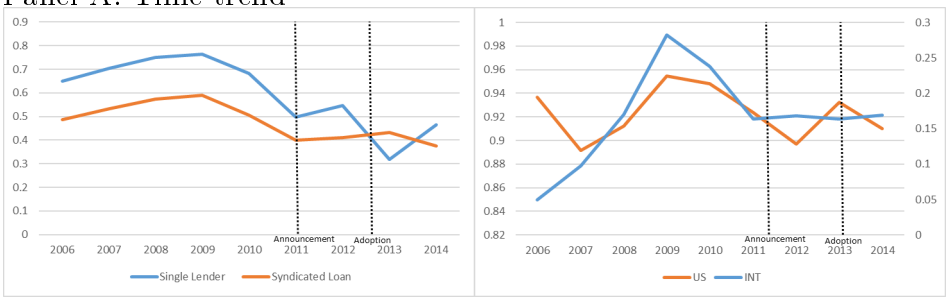


Figure 2: PVIOL

Panel A: Time-trend



Panel B: Year Regression Coefficients

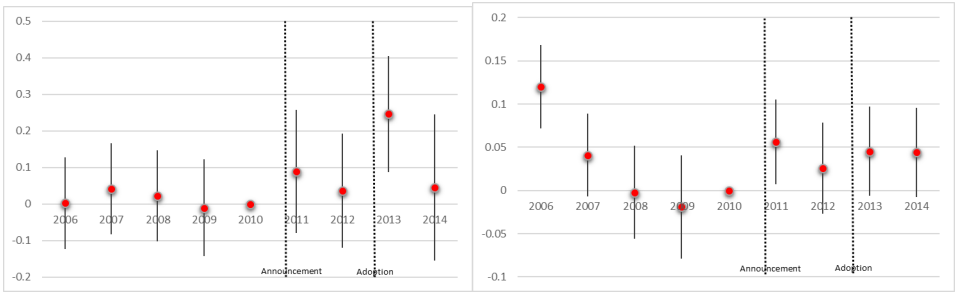


Figure 3: Performance Pricing Provisions

Panel A: Time-trend

Panel B: Year Regression Coefficients

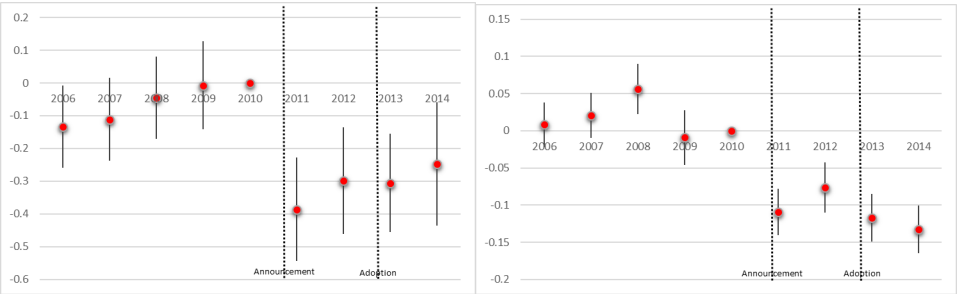
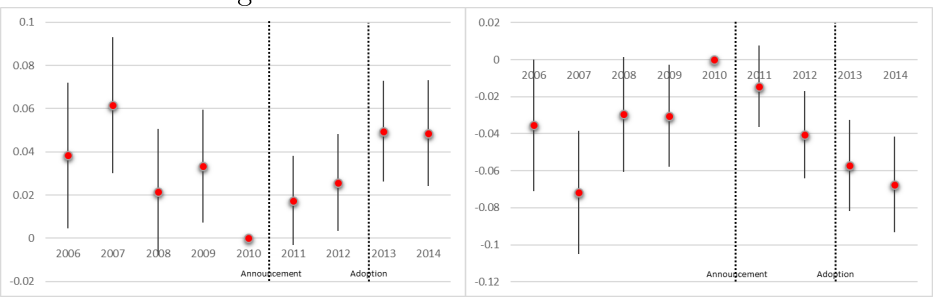


Figure 4: %Loans and %Bonds

Panel A: Time-trend

Panel B: Year Regression Coefficients



Tables

Table 1: Descriptive Statistics

Panel A: Full Sample

	N	Mean	SD	P25	P50	P75
Syndicated	12,759	0.971	0.167	1.000	1.000	1.000
Maturity	12,759	52.139	26.017	36.000	59.218	60.000
PPP	12,759	0.304	0.460	0.000	0.000	1.000
Spread	12,759	1.854	1.409	0.850	1.500	2.500
log($ Loan)	12,759	19.136	2.204	18.419	19.519	20.586
Secured	12,759	0.456	0.498	0.000	0.000	1.000
% Lead	12,759	0.087	0.155	0.000	0.000	0.125
# Acc. Cov.	12,759	1.004	1.240	0.000	0.000	2.000
Div. Cov.	12,759	0.281	0.450	0.000	0.000	1.000
CAPEX Cov.	12,759	0.070	0.255	0.000	0.000	0.000
# Sweeps	12,759	0.495	1.264	0.000	0.000	0.000
PVIOL	4,442	0.479	0.388	0.099	0.389	0.973
CAPEX	4,440	0.059	0.076	0.015	0.035	0.067
LEV	4,135	0.308	0.221	0.154	0.282	0.410
MTB	4,223	3.370	8.567	1.349	2.028	3.239
ROA	4,357	0.028	0.116	0.010	0.037	0.071
SIZE	4,268	7.311	1.703	6.240	7.377	8.419
TANG	4,173	0.333	0.274	0.100	0.240	0.550
Z_SCORE	3,836	5.925	13.491	1.325	2.713	4.857

Table 1: Descriptive Statistics

Panel B: Syndicated and Single-Lender Loans

	Syndicated Loans				Non-Syndicated Loans			
	N	SD	Mean	P50	N	SD	Mean	P50
Maturity	3,179	15.242	53.99	60.00	368	18.687	41.46	36.00
PPP	3,179	0.441	0.74	1.00	368	0.500	0.47	0.00
Spread	3,179	1.307	1.95	1.75	368	1.851	2.76	2.48
log($ Loan)	3,179	1.141	19.83	19.81	368	1.106	17.63	17.50
Secured	3,179	0.493	0.58	1.00	368	0.403	0.80	1.00
% Lead	3,179	0.154	0.09	0.00	368	0.427	0.24	0.00
# Acc. Cov.	3,179	0.740	1.92	2.00	368	0.873	2.08	2.00
Div. Cov.	3,179	0.460	0.70	1.00	368	0.432	0.75	1.00
CAPEX Cov.	3,179	0.385	0.18	0.00	368	0.477	0.35	0.00
# Sweeps	3,179	1.772	1.24	0.00	368	1.774	1.24	0.00
PVIOL	3,148	0.380	0.47	0.38	364	0.378	0.66	0.83
CAPEX	3,179	0.071	0.06	0.04	368	0.093	0.07	0.04
LEV	3,179	0.201	0.29	0.27	368	0.247	0.26	0.21
MTB	3,179	8.624	3.37	2.08	368	7.338	3.56	1.86
ROA	3,179	0.104	0.04	0.04	368	0.211	-0.04	0.02
SIZE	3,179	1.630	7.46	7.48	368	1.688	5.34	5.17
TANG	3,179	0.261	0.33	0.24	368	0.259	0.30	0.21
Z_SCORE	3,179	13.473	6.03	2.82	368	16.813	6.96	2.74

Table 1: Descriptive Statistics

Panel C: Syndicated and Single-Lender Loans around TD9599 Adoption

	Syndicated Pre		Syndicated Post		Single-Lender Pre		Single-Lender Post	
	SD	Mean	SD	Mean	SD	Mean	SD	Mean
Maturity	16.077	52.83	12.105	57.17	18.553	41.84	19.532	39.04
PPP	0.406	0.79	0.494	0.58	0.500	0.48	0.501	0.44
Spread	1.364	1.98	1.129	1.87	1.803	2.80	2.134	2.47
log($ Loan)	1.141	19.70	1.065	20.19	1.125	17.56	0.878	18.04
Secured	0.489	0.60	0.499	0.53	0.368	0.84	0.505	0.52
% Lead	0.163	0.10	0.122	0.07	0.435	0.25	0.370	0.16
# Acc. Cov.	0.765	1.98	0.637	1.74	0.885	2.16	0.606	1.60
Div. Cov.	0.426	0.76	0.500	0.52	0.402	0.80	0.503	0.46
CAPEX Cov.	0.406	0.21	0.305	0.10	0.485	0.38	0.370	0.16
# Sweeps	1.818	1.31	1.628	1.07	1.763	1.24	1.858	1.24
PVIOL	0.381	0.50	0.371	0.41	0.362	0.70	0.383	0.41
CAPEX	0.074	0.06	0.063	0.05	0.093	0.07	0.090	0.07
LEV	0.205	0.29	0.190	0.32	0.251	0.25	0.220	0.28
MTB	7.483	3.21	11.178	3.80	6.832	3.28	9.884	5.32
ROA	0.109	0.03	0.090	0.04	0.219	-0.05	0.144	-0.00
SIZE	1.614	7.27	1.554	8.00	1.652	5.19	1.591	6.33
TANG	0.263	0.33	0.254	0.31	0.256	0.30	0.283	0.32
Z_SCORE	11.641	5.60	17.519	7.19	14.839	6.41	26.046	10.42

Table 1: Descriptive Statistics

Panel D: U.S. Syndicates and International Syndicates

	U.S. Syndicates				International Syndicates			
	N	SD	Mean	P50	N	SD	Mean	P50
Maturity	4,229	16.457	53.23	60.00	7,645	30.696	51.86	50.27
PPP	4,229	0.462	0.69	1.00	7,645	0.210	0.05	0.00
Spread	4,229	1.367	2.03	1.75	7,645	1.384	1.71	1.30
log($ Loan)	4,229	1.107	19.95	19.92	7,645	2.577	18.74	19.34
Secured	4,229	0.495	0.57	1.00	7,645	0.480	0.36	0.00
% Lead	4,229	0.147	0.09	0.00	7,645	0.126	0.08	0.00
# Acc. Cov.	4,229	0.964	1.82	2.00	7,645	1.073	0.43	0.00
Div. Cov.	4,229	0.469	0.67	1.00	7,645	0.086	0.01	0.00
CAPEX Cov.	4,229	0.355	0.15	0.00	7,645	0.041	0.00	0.00
# Sweeps	4,229	1.718	1.16	0.00	7,645	0.212	0.02	0.00

Table 1: Descriptive Statistics

Panel E: U.S. and International Syndicates around TD9599 Adoption

	U.S. Pre		U.S. Post		Int. Pre		Int. Post	
	SD	Mean	SD	Mean	SD	Mean	SD	Mean
Maturity	17.342	52.18	13.323	56.11	31.986	51.64	26.355	52.55
PPP	0.435	0.75	0.499	0.54	0.215	0.05	0.193	0.04
Spread	1.437	2.06	1.151	1.94	1.327	1.58	1.478	2.10
log($ Loan)	1.114	19.85	1.045	20.21	2.591	18.66	2.523	18.98
Secured	0.490	0.60	0.500	0.50	0.480	0.36	0.478	0.35
% Lead	0.154	0.09	0.124	0.07	0.126	0.08	0.127	0.08
# Acc. Cov.	0.987	1.88	0.882	1.69	1.070	0.42	1.081	0.44
Div. Cov.	0.442	0.73	0.500	0.50	0.095	0.01	0.051	0.00
CAPEX Cov.	0.377	0.17	0.275	0.08	0.044	0.00	0.033	0.00
# Sweeps	1.768	1.25	1.549	0.92	0.239	0.02	0.083	0.00

Table 1: Descriptive Statistics

Panel F: U.S. Firms and Non-U.S. Firms

	U.S. Firms				Non-U.S. Firms			
	N	SD	Mean	P50	N	SD	Mean	P50
LOANPCT	6,972	0.287	0.34	0.31	3,686	0.293	0.35	0.30
BONDPCT	6,972	0.296	0.62	0.64	3,686	0.299	0.59	0.59
SECUREDPCT	6,972	6.535	0.65	0.56	3,686	0.374	0.49	0.49
SENIORPCT	6,972	6.541	0.90	0.85	3,686	0.246	0.82	0.88
REVOLVINGPCT	6,972	0.857	0.14	0.03	3,686	0.199	0.13	0.04
DEBTEBITDA	6,972	0.144	0.01	0.01	3,686	0.035	0.01	0.01

Table 1: Descriptive Statistics

Panel G: U.S. and Non-U.S. Capital Structure around TD9599 Adoption

	U.S. Pre		U.S. Post		Non-U.S. Pre		Non-U.S. Post	
	SD	Mean	SD	Mean	SD	Mean	SD	Mean
LOANPCT	0.285	0.35	0.289	0.33	0.300	0.37	0.280	0.32
BONDPCT	0.295	0.62	0.299	0.62	0.303	0.57	0.290	0.61
SECUREDPCT	7.829	0.69	0.414	0.55	0.379	0.49	0.366	0.48
SENIORPCT	7.838	0.93	0.318	0.83	0.261	0.82	0.223	0.81
REVOLVINGPCT	1.019	0.14	0.200	0.12	0.209	0.14	0.181	0.11
DEBTEBITDA	0.169	0.02	0.059	0.01	0.037	0.01	0.032	0.01

Table 2: The Effect of a Reduction in Renegotiation Costs on Initial Terms - Maturity

Panel A: Single-Lender vs. Syndicated Loans around TD9599 Adoption

	Maturity		Maturity		Maturity		Maturity	
Synd. × POST	7.19***	(3.41)	7.35**	(3.05)	12.32***	(4.12)	12.14***	(4.36)
Syndicated	10.38***	(10.13)	4.34**	(2.93)	3.44*	(2.17)	3.48	(1.84)
POST	-2.68	(-1.04)	-3.21	(-1.19)	36.19***	(3.63)	39.23***	(4.80)
Spread			-0.78	(-0.84)	-1.20	(-1.18)	-1.57	(-1.60)
log($ Loan)			3.79***	(8.39)	4.33***	(11.52)	4.52***	(16.21)
Secured			-0.11	(-0.15)	0.06	(0.07)	0.28	(0.24)
% Lead			-1.50	(-0.93)	-0.82	(-0.47)	-0.96	(-0.47)
PPP			-0.18	(-0.20)	-1.19	(-1.12)	-1.07	(-1.24)
# Acc. Cov.			-0.32	(-0.71)	-0.39	(-0.74)	-0.18	(-0.29)
Div. Cov.			1.91	(1.42)	2.74	(1.49)	5.94***	(6.28)
CAPEX Cov.			-0.66	(-0.80)	-0.63	(-0.68)	-0.29	(-0.25)
# Sweeps			0.76**	(2.50)	0.96**	(3.29)	1.21***	(4.46)
CAPEX			-8.91*	(-1.88)	-11.72*	(-1.97)	-7.40	(-1.33)
LEV			-0.94	(-0.65)	-1.64	(-0.96)	-1.78	(-0.89)
MTB			0.05	(1.16)	0.09	(1.77)	0.10	(1.48)
ROA			12.31***	(5.24)	11.74***	(4.64)	11.02***	(4.22)
SIZE			-1.43***	(-4.64)	-1.48***	(-3.97)	-1.84***	(-5.98)
TANG			1.11	(0.70)	2.21	(1.21)	1.86	(0.74)
Z_SCORE			-0.03	(-1.31)	-0.04	(-1.38)	-0.04	(-1.28)
N	3,547		3,547		3,547		2,940	
Adj. R^2	0.16		0.22		0.22		0.26	
Ind. & Rat FE	Yes		Yes		Yes		No	
Interactions	No		No		Yes		Yes	
Ann. Per.	Yes		Yes		Yes		Yes	

Absorption of fixed effects, inclusion of control × POST interactions, and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 2: The Effect of a Reduction in Renegotiation Costs on Initial Terms - Maturity

Panel B: U.S. Syndicates vs. International Syndicates around TD9599 Adoption

	Maturity		Maturity		Maturity		Maturity		Maturity		Maturity	
US × POST	3.03*	(1.96)	8.45**	(2.64)	13.86***	(9.37)	4.65***	(3.51)	3.45**	(2.46)	5.96***	(5.31)
POST	0.91	(0.46)	36.57***	(5.70)	42.47***	(5.87)	-0.98	(-0.61)	-0.50	(-0.35)	-0.88	(-0.51)
US	0.54	(0.35)	-5.55	(-1.68)	-10.97***	(-9.14)						
Spread			0.05	(0.05)	-0.50	(-0.43)			-1.71**	(-2.91)	-2.25***	(-4.16)
log($ Loan)			1.00**	(2.45)	1.47***	(4.36)			1.15*	(2.22)	1.05	(1.73)
Secured			11.12***	(8.37)	12.02***	(7.16)			5.86***	(5.58)	5.93***	(4.97)
% Lead			2.98	(1.23)	4.15	(1.49)			-7.61**	(-2.55)	-8.60*	(-1.92)
PPP			0.72	(0.62)	1.02	(0.89)			-0.16	(-0.20)	-0.00	(-0.00)
# Acc. Cov.			0.02	(0.03)	0.10	(0.14)			-0.95**	(-2.65)	-0.96*	(-2.01)
Div. Cov.			1.06	(0.56)	3.97***	(3.74)			0.45	(0.28)	2.10	(1.22)
CAPEX Cov.			-1.24	(-0.97)	-0.26	(-0.19)			-3.32**	(-2.66)	-2.82*	(-1.93)
# Sweeps			0.89*	(2.23)	1.19**	(2.58)			0.51	(1.21)	0.92**	(2.51)
N	11,874		11,874		9,474		11,874		11,874		8,669	
Adj. R^2	0.00		0.05		0.06		0.58		0.59		0.60	
Interactions	No		Yes		Yes		No		No		No	
Firm FE	No		No		No		Yes		Yes		Yes	
Ann. Per.	Yes		Yes		No		Yes		Yes		No	

Absorption of firm fixed effects and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Absorption of firm fixed effects subsumes the direct effect of US. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 3: The Effect of a Reduction in Renegotiation Costs on Initial Terms - Probability of Violation

Panel A: Single-Lender vs. Syndicated Loans around TD9599 Adoption

	PVIOL		PVIOL		PVIOL		PVIOL	
Synd. × POST	0.19**	(2.57)	0.14*	(2.15)	0.08*	(1.93)	0.09*	(2.02)
Syndicated	-0.13***	(-7.11)	-0.03	(-1.42)	-0.02	(-1.15)	-0.02	(-0.86)
POST	-0.24**	(-3.18)	-0.17**	(-2.48)	-0.89***	(-4.30)	-1.03***	(-5.49)
Spread			-0.01	(-1.36)	-0.01	(-0.98)	-0.01	(-1.51)
Maturity			-0.00**	(-2.71)	-0.00*	(-1.92)	-0.00*	(-1.91)
log($ Loan)			-0.02	(-1.33)	-0.03*	(-2.30)	-0.03**	(-2.49)
Secured			0.11***	(3.61)	0.12***	(3.90)	0.13***	(3.80)
% Lead			0.01	(0.13)	0.02	(0.42)	-0.00	(-0.02)
PPP			0.01	(0.72)	0.01	(0.26)	0.02	(0.56)
Div. Cov.			0.03	(1.54)	0.05**	(2.71)	0.03	(1.37)
CAPEX Cov.			0.01	(0.34)	-0.00	(-0.03)	-0.01	(-0.41)
# Sweeps			0.00	(0.27)	0.00	(0.35)	0.00	(0.58)
CAPEX			0.04	(0.25)	0.04	(0.27)	0.01	(0.05)
LEV			0.50***	(8.30)	0.52***	(7.06)	0.47***	(6.29)
MTB			0.00	(1.14)	0.00	(0.22)	-0.00	(-0.17)
ROA			-0.28*	(-2.09)	-0.20	(-1.53)	-0.13	(-1.11)
SIZE			-0.03**	(-2.85)	-0.03*	(-2.08)	-0.03	(-1.83)
TANG			-0.06	(-1.74)	-0.07	(-1.79)	-0.05	(-1.36)
Z_SCORE			-0.00	(-0.35)	-0.00	(-0.32)	-0.00	(-0.71)
N	3,512		3,512		3,512		2,916	
Adj. R^2	0.26		0.38		0.39		0.38	
Ind. & Rat FE	Yes		Yes		Yes		Yes	
Interactions	No		No		Yes		Yes	
Ann. Per.	Yes		Yes		Yes		No	

Absorption of fixed effects, inclusion of control × POST interactions, and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 3: The Effect of a Reduction in Renegotiation Costs on Initial Terms - Accounting Covenants

Panel B: U.S. Syndicates vs. International Syndicates around TD9599 Adoption

	Acc.	Cov.	Acc.	Cov.	Acc.	Cov.	Acc.	Cov.	Acc.	Cov.	Acc.	Cov.
US × POST	-0.01	(-0.47)	0.07*	(2.26)	0.11***	(4.63)	-0.04*	(-1.91)	-0.01	(-0.34)	0.00	(0.04)
POST	0.01	(0.41)	-0.13	(-0.46)	-0.20	(-0.58)	0.01	(1.05)	0.02	(1.25)	0.02	(1.10)
US	0.77***	(27.03)	0.67***	(21.05)	0.63***	(28.03)						
Spread			-0.03**	(-3.26)	-0.02**	(-2.88)			-0.01*	(-2.12)	-0.01*	(-1.92)
Maturity			0.00	(1.40)	0.00	(0.83)			-0.00	(-0.97)	-0.00	(-1.23)
log($ Loan)			-0.05***	(-5.29)	-0.05***	(-4.46)			0.00	(1.04)	0.00	(0.73)
Secured			0.04	(1.83)	0.03	(1.29)			0.04**	(3.05)	0.05**	(2.98)
% Lead			0.11*	(2.24)	0.08	(1.66)			-0.03	(-0.97)	-0.02	(-0.68)
PPP			0.15***	(5.35)	0.19***	(11.82)			0.08***	(5.88)	0.10***	(6.46)
Div. Cov.			0.05**	(2.51)	0.06*	(2.07)			0.06**	(3.16)	0.07**	(3.00)
CAPEX Cov.			0.08***	(4.62)	0.09***	(4.18)			0.16***	(7.74)	0.17***	(6.33)
# Sweeps			-0.00	(-0.79)	-0.00	(-0.31)			-0.01	(-1.20)	-0.01	(-1.28)
N	11,874		11,874		9,474		11,874		11,874		8,669	
Adj. R^2	0.55		0.60		0.61		0.77		0.77		0.76	
Interactions	No		Yes		Yes		No		No		No	
Firm FE	No		No		No		Yes		Yes		Yes	
Ann. Per.	Yes		Yes		No		Yes		Yes		No	

Absorption of firm fixed effects and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Absorption of firm fixed effects subsumes the direct effect of US. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 4: The Effect of a Reduction in Renegotiation Costs on Initial Terms - Performance Pricing

Panel A: Single-Lender vs. Syndicated Loans around TD9599 Adoption

	PPP		PPP		PPP		PPP	
Synd. × POST	-0.13*	(-2.11)	-0.19***	(-4.28)	-0.14**	(-3.14)	-0.17***	(-3.87)
Syndicated	0.12*	(2.27)	0.11**	(3.33)	0.10**	(3.21)	0.13***	(6.55)
POST	-0.04	(-0.90)	0.07	(1.78)	-0.06	(-0.24)	0.09	(0.33)
Spread			-0.05***	(-6.09)	-0.05***	(-4.67)	-0.05***	(-5.13)
Maturity			-0.00	(-0.96)	-0.00	(-0.64)	-0.00	(-0.27)
log($ Loan)			0.03***	(5.25)	0.03***	(4.74)	0.04***	(7.49)
% Lead			0.44***	(4.49)	0.36***	(4.11)	0.26***	(9.42)
Secured			0.05*	(2.00)	0.05	(1.80)	0.06*	(1.93)
Revolver			0.11***	(4.05)	0.15***	(5.56)	0.18***	(9.60)
TakeOver			0.05	(1.56)	0.02	(0.72)	-0.01	(-0.39)
CAPEX			-0.06	(-0.45)	-0.01	(-0.08)	-0.06	(-0.51)
LEV			-0.09*	(-1.96)	-0.08	(-1.40)	-0.14**	(-2.65)
MTB			-0.00	(-0.18)	0.00	(0.33)	0.00	(0.56)
ROA			-0.07	(-1.53)	-0.09	(-1.69)	-0.08	(-1.12)
TANG			0.03	(0.73)	0.06	(1.30)	0.10*	(2.08)
Z_SCORE			0.00	(1.65)	0.00	(0.22)	-0.00	(-0.25)
# Acc. Cov.			0.18***	(16.89)	0.18***	(14.68)	0.19***	(13.71)
# Sweeps			0.02**	(2.84)	0.02**	(3.03)	0.02**	(2.48)
PROB_PREPAY			0.99	(0.63)	0.77	(0.51)	0.09	(0.05)
PROB_DOWN			0.93	(0.52)	0.87	(0.49)	0.27	(0.14)
VolCreditSpread			0.07*	(2.16)	0.08**	(2.31)	0.07**	(2.61)
ExpVolRet			0.00	(1.36)	0.00	(0.95)	0.00	(0.58)
Predictability			-0.04	(-0.39)	-0.10	(-1.25)	-0.10	(-1.05)
SIZE			0.02*	(2.21)	0.02	(1.69)	0.01	(1.17)
N	6,527		6,527		6,527		5,273	
Adj. R^2	0.06		0.31		0.32		0.36	
Ind. & Rat FE	Yes		Yes		Yes		No	
Interactions	No		No		Yes		Yes	
Ann. Per.	Yes		Yes		Yes		No	

Absorption of fixed effects, inclusion of control × POST interactions, and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 4: The Effect of a Reduction in Renegotiation Costs on Initial Terms - Performance Pricing

Panel B: U.S. Syndicates vs. International Syndicates around TD9599 Adoption

	PPP		PPP		PPP		PPP		PPP		PPP	
US_TD_AD	-0.15***	(-3.64)	-0.10***	(-3.83)	-0.12***	(-4.72)	-0.14***	(-3.36)	-0.11***	(-3.38)	-0.16***	(-7.44)
POST	-0.01	(-1.51)	0.01	(0.25)	0.03	(0.50)	-0.00	(-0.08)	0.00	(0.22)	-0.00	(-0.48)
US	0.45***	(11.64)	0.29***	(11.77)	0.32***	(12.22)						
Spread			-0.02***	(-4.48)	-0.02***	(-5.31)			-0.02***	(-6.97)	-0.02***	(-13.20)
Maturity			0.00*	(2.14)	0.00**	(2.38)			0.00*	(1.98)	0.00***	(3.76)
log($ Loan)			0.02***	(11.82)	0.03***	(9.61)			0.01***	(3.68)	0.01***	(4.45)
% Lead			0.24***	(4.26)	0.17***	(7.48)			0.33***	(5.77)	0.27***	(5.57)
facsecured			-0.00	(-0.10)	0.00	(0.47)			0.04***	(6.58)	0.03***	(4.43)
Revolver			0.07***	(4.12)	0.09***	(7.59)			0.05***	(4.50)	0.05***	(5.51)
TakeOver			0.05***	(4.12)	0.04**	(3.13)			0.03*	(2.23)	0.02	(1.50)
# Acc. Cov.			0.08***	(7.22)	0.09***	(5.88)			0.12***	(14.48)	0.12***	(12.63)
# Sweeps			0.02***	(4.48)	0.02***	(3.94)			0.03***	(5.22)	0.03***	(4.05)
N	26,594		26,594		21,446		26,594		26,594		20,821	
Adj. R^2	0.27		0.36		0.38		0.43		0.51		0.55	
Interactions	No		Yes		Yes		No		No		No	
Firm FE	No		No		No		Yes		Yes		Yes	
Ann. Per.	Yes		Yes		No		Yes		Yes		No	

Absorption of firm fixed effects and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Absorption of firm fixed effects subsumes the direct effect of US. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 5: Relationship between Lender Choice and Renegotiation Costs

Panel A: Public vs. Private Debt Choice around TD9599 Adoption

	LOAN		LOAN		LOAN		LOAN	
POST	0.04***	(12.54)	0.03***	(10.09)	0.08***	(13.58)	0.06***	(11.01)
AQ			-0.16**	(-2.58)			-0.14	(-1.84)
LEV			-0.18**	(-2.80)			-0.10	(-1.50)
MTB			-0.00	(-1.52)			-0.00	(-0.25)
SIZE			-0.08***	(-11.63)			-0.09***	(-9.23)
TANG			-0.01	(-0.21)			-0.02	(-0.38)
Z_SCORE			0.00	(0.87)			0.00	(0.13)
N	8,390		8,390		6,690		6,690	
Adj. R^2	0.18		0.22		0.18		0.21	
Ind., Year., & Rating FE	Yes		Yes		Yes		Yes	
Ann. Per.	Yes		Yes		No		No	

Absorption of fixed effects and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 5: Relationship between Lender Choice and Renegotiation Costs

Panel B: Capital Structure: U.S. vs International Firms around TD9599 Adoption

	Loan %		Loan %		Loan %	
US × POST	0.02*	(1.89)	0.03*	(2.06)	0.03*	(2.16)
POST	-0.02	(-1.79)	-0.02	(-1.73)	-0.27***	(-5.01)
SECUREDPCT			0.07**	(3.01)	0.17***	(7.45)
SENIORPCT			-0.07**	(-2.97)	-0.17***	(-7.46)
REVOLVINGPCT			0.03*	(1.95)	0.05	(1.36)
DEBTEBITDA			-0.02	(-1.10)	-0.01	(-0.63)
N	10,658		10,658		10,658	
Adj. R^2	0.75		0.76		0.21	
Firm FE	Yes		Yes		No	
Country FE	Yes		Yes		Yes	
Interactions	No		No		Yes	

Absorption of fixed effects, inclusion of control × POST interactions, and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Table 5: Relationship between Lender Choice and Renegotiation Costs

Panel C: Capital Structure: U.S. vs International Firms around TD9599 Adoption

	Bond %		Bond %		Bond %	
US × POST	-0.04**	(-2.45)	-0.04**	(-2.58)	-0.05**	(-2.77)
POST	0.03*	(2.07)	0.02*	(1.98)	0.17**	(2.42)
SECUREDPCT			-0.07**	(-2.94)	-0.13***	(-4.51)
SENIORPCT			0.07**	(2.92)	0.13***	(4.52)
REVOLVINGPCT			-0.01	(-0.72)	-0.03	(-0.88)
DEBTEBITDA			0.03	(1.04)	0.04	(1.02)
N	10,658		10,658		10,658	
Adj. R^2	0.75		0.75		0.15	
Firm FE	Yes		Yes		No	
Country FE	Yes		Yes		Yes	
Interactions	No		No		Yes	

Absorption of fixed effects, inclusion of control × POST interactions, and exclusion of the period between announcement and adoption of TD9599 are indicated in the final rows of the table. Standard errors are adjusted at the firm and year level for clustering using the Stata package `reghdfe` from Correia (2017). Statistical significance is indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. t statistics are in parentheses.

Appendix A - The tax consequences of debt restructuring

The examples reported here are based on examples reported appeared on "A road map of tax consequences of modifying debt, published on "The Tax Adviser" on May 31, 2012.

Case 1: Debt is not publicly traded

The original terms of the loan provide for a 10% interest rate. The $100 principal amount is equal to the amount of cash loaned. The lender is the original lender, and agrees to reduced the rate to 8%. All accrued interests have been paid, and no accrued interest is being forgiven.

- Impact to borrower: no CODI is recognized because the issue price remains the same
- Impact to lender: no loss is recognized since the issue price of the new debt is still $100

Case 2: Debt is not publicly traded

The original lender sells the debt to a third party for $90, less than the original principal amount of $100. After the transfer, interest terms are renegotiated from 10% to 8%.

- Impact to borrower: none
- Impact to original lender: recognize a $10 loss
- Impact to new holder: recognize a $10 gain at renegotiation due to the receipt of a debt instrument with an issue price of $100, while the tax basis for the per-renegotiation loan was $90

Case 3: Debt is publicly traded

The original terms of the loan provide for a 10% interest rate. The $100 principal amount is equal to the amount of cash loaned. The lender is the original lender, and agrees to reduced the rate to 8%. All accrued interests have been paid, and no accrued interest is being forgiven. The debt is publicly traded with a fair market value of $90

- Impact to borrower: $10 of CODI is recognized. The amount is the difference between the post-renegotiation issue price of $90 and the original amount borrowed of $100. The exchange also creates $10 of OID, resulting in interest deductions to the borrower over the remaining term of the new debt.
- Impact to lender: a loss of $10 is recognized because the lender's amount realized is the post-renegotiation issue price of $90, less than the original tax basis of $100. Also, the exchange creates OID to be recognized as interest over the remaining term of the new debt

Case 4: Debt is publicly traded

The original lender sells the debt to a third party for $90, less than the original principal amount of $100. After the transfer, interest terms are renegotiated from 10% to 8%. All accrued interests have been paid, and no accrued interest is being forgiven. The debt is publicly traded with a fair market value of $90

- Impact to borrower: COD of $10 and OID deductions of $10 over the life of the instrument
- Impact to original lender: a loss of $10 is recognized from the sale of the loan for $90
- Impact to new holder: OID income of $10 over the life of the instrument (absent renegotiation, the $10 would not represent OID).

Appendix B: Variables Definition

Variable Name	Variable Description
Dependent Variables	
Maturity	Maturity of the loan contract expressed in months.
PVIOL	Probability of covenant violation, as in Demerjian and Owens (2015).
Acc. Cov.	1 if the loan includes a dividend distribution restriction, 0 otherwise.
PPP	1 if the loan contract includes a performance pricing provision, 0 otherwise.
Variables of Interest	
Syndicated	1 if syndicated U.S. loan, 0 if single-lender U.S. loan.
US	1 if syndicated U.S. loan, 0 if syndicated international loan.
Loan Controls	
Spread	Interest spread charged to the borrower.
Log($ Loan)	Natural log of the amount of loan issued.
Secured	1 if the loan is secured, 0 otherwise.
% Lead	Percentage of the loan amount allocated to the lead arranger.
# Acc. Cov.	Count of the number of accounting covenants included in the loan contract.
Div. Cov.	1 if the loan includes a dividend distribution restriction, 0 otherwise.
CAPEX Cov.	1 if the loan includes an investment restriction, 0 otherwise.
# Sweeps	Number of sweeps included in the loan contract.
Revolver	1 if the loan is revolving, 0 otherwise.
TakeOver	1 if the loan purpose is a merger or acquisition, 0 otherwise.

Appendix B: Variables Definition

Variable Name	Variable Description
Borrower Controls	
CAPEX	Capital Expenditures over total assets.
LEV	Long term debt over total assets.
MTB	Market value of equity over book value of equity.
ROA	Net income over average total assets.
SIZE	Natural log of total assets.
TANG	(Total assets - intangible assets) over total assets.
Z_SCORE	Score calculated as in Altman (1968).
PROB_PREPAY	Sum of the probability of rating upgrade and debt withdrawal.
PROB_DOWN	Probability that the borrower's credit quality will decline, but not default.
ExpVolRet	Average standard deviation of returns in the firm's industry, multiplied by the loan maturity.
VolCreditSpread	Annual variance of spreads for a given loan risk class.
Predictability	See Asquith et al. (2005), p. 115.
SECUREDPCT	Percentage of debt outstanding secured.
SENIORPCT	Percentage of debt outstanding that is senior.
REVOLVINGPCT	Percentage of debt outstanding that is revolving.
DEBTEBITDA	Debt over ebitda.