Relationship Lending when Borrowers are in Distress

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Abstract

In this paper I investigate whether relationship lending helps borrowers experiencing idiosyncratic financial distress. By constructing a novel dataset on syndicated lending that tracks the availability and pricing of credit for US corporate borrowers over three decades, I conclude that relationship lending benefits borrowers in distress. In particular, I explicitly distinguish loan renegotiations from new originations, and account for the state-contingent provisions on loan pricing present in a large fraction of credit agreements. I compare loan terms granted to borrowers in distress by relationship and non-relationship lenders. By employing a within-firm approach to alleviate possible selection issues, I find that relationship lenders provide a higher credit amount, charge lower interest rates, and require similar collateral and fees. I also show that firms benefit from relationship lending irrespective of their access to outside financing options. Overall, my findings provide support to theories of implicit commitment and reputational capital in lending relationships.

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INTRODUCTION

Is it valuable for firms to establish and maintain a bank credit relationship? Do stronger bank relationships help corporate borrowers when they experience financial distress? The outstanding literature offers contrasting answers to these questions. We know that banks often act as relationship lenders, acquiring private information on their borrowers over time through repeated interactions (Boot, 2000). Yet, from a theoretical perspective there are both benefits and costs associated with strong lending relationships. From an empirical perspective, the benefits generally appear to outweigh the costs, especially during normal economic circumstances and times of aggregate distress.[1]

We know less about the implications of establishing a strong lending relationship in circumstances of idiosyncratic borrower distress outside of crisis times.[2] Filling this gap is relevant for several reasons. First, financial distress is costly. Estimates put the costs of financial distress in the range of 10 to 25% of pre-distressed firm value (Andrade & Kaplan, 1998; Davydenko, Strebulaev, & Zhao, 2012). Second, lenders are likely to play an important role in out-of-court renegotiations to resolve situations of distress (Campello, Ladika, & Matta, 2018; Gilson, John, & Lang, 1990). Third, from a firm risk management perspective, it is important to understand whether an established credit relationship could mitigate the costs associated with distress.

Theories of relationship lending offer competing predictions on this issue. First, relationship lenders could provide insurance to borrowers in distress, either to extract higher rents in normal times (Berlin & Mester, 1999; Bolton et al., 2016; Petersen & Rajan, 1995), honor implicit commitment and preserve reputational capital (Boot, Greenbaum, & Thakor, 1993; Dinç, 2000), or avoid the realization of possible losses on their balance sheet (Dewatripont & Maskin, 1995; Hu & Varas, 2021). Second, relationship banks could hold up their borrowers, exploiting the presence of informational monopolies (Rajan, 1992; Sharpe, 1990). Third, there might be no

1. For evidence that relationship lending benefits firms in normal times, see: Berger and Udell (1995); Bharath, Dahiya, Saunders, and Srinivasan (2007, 2011); Dahiya, Hallak, and Matthys (2021); Degryse and Ongena (2005); Drucker and Puri (2005); Petersen and Rajan (1994); Schenone (2010). For evidence that relationship lending provides insurance during financial crises and times of aggregate distress, see: Beck, Degryse, Haas, and Horen (2018); Berlin and Mester (1999); Bolton, Freixas, Gambacorta, and Mistrulli (2016); DeYoung, Gron, Torna, and Winton (2015); Jiménez, Ongena, Peydró, and Saurina (2012); Karolyi (2018); Sette and Gobbi (2015).

2. The existing empirical evidence is scant, and the results are mixed. Elsas and Krahnen (1998), Hoshi, Kashyap, and Scharfstein (1990), and Schäfer (2019) provide evidence that stronger credit relationships benefit firms in distress through liquidity insurance. Peek and Rosengren (2005) find that lenders with strong corporate affiliations to firms have a higher propensity to "evergreen" loans when firms are in trouble, to avoid the realization of losses on their balance sheets. Li, Lu, and Srinivasan (2019) instead find no effect of relationship lending on credit terms when borrowers are in distress.

difference between borrowing from relationship or non-relationship lenders for firms in distress. If lenders engage in relationship lending mainly to win future lending and non-lending business (Bharath et al., 2007; Drucker & Puri, 2005), they might not give any preferential treatment to borrowers in distress because at that point the continuation value of the relationship could be very low.

The objective of this paper is therefore to empirically investigate whether relationship lending helps borrowers when they experience idiosyncratic financial distress, in the context of the US syndicated loan market. To achieve this goal, I explicitly distinguish loan renegotiations from new originations and account for the state-contingent provisions on loan pricing present in a large fraction of credit agreements. This allows me to construct a novel dataset that tracks the availability and pricing of credit for US corporate borrowers over three decades, similar to a credit register. I exploit this dataset to compare the loan terms granted to borrowers in distress by relationship and non-relationship lenders. By employing a within-firm approach to alleviate possible selection issues, I find that relationship lenders provide a higher credit amount, charge lower interest rates, and require similar collateral and fees. I also show that firms benefit from relationship lenders irrespective of their access to alternative financing options. Overall, my findings provide support to theories of implicit commitment and reputational capital in lending relationships.

In order to perform my analysis, I obtain data on a large sample of syndicated loans over the period 1987-2016 from Refinitiv/Thomson Reuters Dealscan, one of the most common data source for research in bank lending and financial contracting. Unlike most of the existing literature, I also obtain detailed information on loan modifications and on performance pricing grids available in the corresponding tables in Dealscan.[3] Using the linking tables provided by Chava and Roberts (2008) and Schwert (2018), I merge each loan observation from Dealscan with borrower and lender characteristics obtained from CRSP/Compustat and Compustat Bank, as well as information on bond issuances from Mergent FISD.

I measure relationship lending by closely following its theoretical definition. In theory, a bank acts as a relationship lender by acquiring non-contractible, private information about its borrowers through repeated interactions. That is why I use the total number of loan events in Dealscan—both new originations and renegotiations—between a borrower and a specific lender over a rolling five-year window to characterize the strength of a credit relationship. This is standardized by the total number of loan events between the borrower and any lender in the

3. Notable exceptions include Chodorow-Reich (2014), who also uses information on loan modifications, and Adam and Streitz (2016) and Asquith, Beatty, and Weber (2005), who specifically analyze the role of performance pricing in syndicated loans.

same five-year window.[4,5]

I measure financial distress by relying on the expected default probability implied by the Merton model of credit risk (Merton, 1974). This measure has several advantages over other measures used in the literature, such as the Altman Z-Score (Altman, 1968). It is a market-based, forward-looking measure, it can be easily computed from stock price and balance sheet data on a monthly frequency, and it is based on the same model as Moody's KMV, a leading indicator of credit risk widely employed in the financial industry. In practice, I follow the "naive" implementation proposed by Bharath and Shumway (2008). I compute the EDF for the universe of CRSP/Compustat firms over the period 1987-2016. Then, I define a given firm to be in distress in a given quarter if over the previous four quarters the firm's EDF was in the top quartile of the overall distribution of EDFs for six or more months.

Equipped with these measures of relationship lending and financial distress, I aim to estimate the causal effect of relationship lending on credit terms when borrowers experience financial distress. To credibly achieve this goal, I need to overcome two main empirical challenges. First, credit terms can change even absent a new loan origination. Specifically, loan agreements can be renegotiated and often contain prespecified state-contingent provisions. Both features could be particularly relevant in distress. On the one hand, it is reasonable that lenders would renegotiate an existing loan rather than originate a new one. On the other hand, terms could automatically change as a borrower enters distress.[6] This issue could be compounded by a different propensity to use state-contingent loan pricing provisions by relationship and non-relationship lenders (Adam & Streitz, 2016).

Second, the matching between banks and firms is non-random, and selection issues could arise. For example, empirical evidence points to firm and bank size as an important determinant of matching (Berger, Miller, Petersen, Rajan, & Stein, 2005; Chen & Song, 2013; Cole, Goldberg, & White, 2004; Hubbard, Kuttner, & Palia, 2002; Stein, 2002). Schwert (2018) documents that more opaque firms borrow from more capitalized banks. Thus, borrowers that establish and maintain strong credit relationships could be significantly different than borrowers who do not.

I address these challenges in two ways. First, I construct a novel dataset on syndicated lending that spans three decades and resembles a credit register for US corporate borrowers, with information on the availability and pricing of credit at the loan-quarter level for each borrower.

4. This measure is commonly used in the literature that studies relationship lending in the context of the syndicated loan market. For example, see: Bharath et al. (2007, 2011); Prilmeier (2016); Schenone (2010).
5. In robustness tests I also use a similar measure weighted by loan amounts, and a dummy variable which capture whether the borrower has interacted with a given lender at least once over the same time window.
6. Renegotiations and the use of state-contingent provisions are generally considered substitutes; Nikolaev (2018) provides empirical evidence consistent with this notion.

In particular, I proceed as follows. I distinguish new loan originations from renegotiations thanks to an algorithm that extracts information from comments to credit agreements. I then assume that a loan agreement is outstanding in either until its stated maturity date or until it is renegotiated. By looking at loan modifications, I can also capture further changes to credit terms over the lifetime of a loan. Finally, I track the pricing of loans over time by explicitly considering the presence of performance pricing grids, and mapping the relevant borrower's performance variable to the level of interest rate spreads and fees specified by the grid.

Second, in my empirical strategy I employ a within-firm approach, which should alleviate possible selection issues. To account for the potentially non-random matching of borrowers and lenders, I control for bank unobserved heterogeneity and time-varying drivers of matching, such as bank capital. Intuitively, my empirical approach consists of comparing the terms of loans to the same borrower granted by two different lenders, characterized by different relationship strengths, in and outside of distress.

Overall, I find strong evidence that relationship lending helps borrowers in distress. In particular, borrowers obtain from their relationship lenders a higher amount of credit and lower interest rate relative to non-relationship lenders. These benefits are economically relevant. A one standard deviation increase in the strength of the lending relationship implies a higher credit availability in distress by 5.3%, which amounts to approximately $8M for the median loan, and a lower cost of credit by 3.9-4.5 basis points, which translates into up to $300,000 of savings over the lifetime of the median loan. Importantly, these effects are not offset by higher commitment fees, collateral requirements, or upfront fees. These results are inconsistent with theories of lender hold-up (Rajan, 1992; Sharpe, 1990; von Thadden, 1995) and provide support to theories of relationship lending predicting insurance provision to borrowers in distress.

In principle, lenders could provide favorable terms to their relationship borrowers in distress for three different reasons. First, they could engage in a value-enhancing intertemporal smoothing of interest rates: lenders provide favorable terms in distress so that they can extract higher rents in normal times (Berlin & Mester, 1999; Bolton et al., 2016; Petersen & Rajan, 1995). Second, lenders could provide insurance in distress to honor implicit commitments, thereby preserving or developing a reputation for providing financial flexibility to borrowers in distress (Boot et al., 1993; Chemmanur & Fulghieri, 1994; Dinç, 2000). Third, it could be optimal for lenders to refinance borrowers in distress (Dewatripont & Maskin, 1995; Hu & Varas, 2021; Puri, 1999). Their borrowers, internalizing this, could obtain favorable terms by threatening to declare default and holding up their lenders (Davydenko & Strebulaev, 2007).

Each set of theories has different cross-sectional predictions on which borrowers are more

likely to benefit from relationship lending during distress. Theories of *intertemporal smoothing* predict that credit terms should be relatively more favorable for borrowers with lower outside options, as they are more likely to accept a higher cost of credit in good times to obtain insurance in bad times. Theories of *borrower hold-up* predict the opposite, as banks should be more willing to keep providing credit to borrowers with access to a broader menu of financing options, which would therefore have a higher incentive to strategically threaten default and obtain better terms. Finally, according to theories of *implicit commitment* and *reputational capital* there should not be any significant difference across borrowers with different outside options.

Motivated by these different theories, I investigate the role of borrowers' outside financing options to shed further light on the actual economic mechanisms at work. I employ the access to public bond markets to capture the degree of borrowers' outside financing options. Firms that issue bonds are likely to have a broader menu of financing options and are characterized by more public information available to market participants—through the market price of their bonds and the analysis of their underwriters (Hale & Santos, 2009; Santos & Winton, 2008).

I repeat my analysis over subsamples of borrowers based on their access to public debt markets. In practice, I perform the subsample analyses using different proxies for bond market access. First, I split loans based on whether the borrower issued at least one public bond at any time before the current loan, or not. Second, I split loans based on whether the borrower issued a public bond in the three years before the current loan, or not. The latter is likely to better capture the current availability of public information about the borrowers compared to the former (Santos & Winton, 2019). In both analyses, I find that borrowers in distress benefit from relationship lending irrespectively of their outside options, though in a qualitatively different way. Borrowers with outside options obtain higher credit amounts, whereas borrowers with no outside options obtain favorable price terms. Overall, these findings are mainly consistent with theories of implicit commitment and reputational capital in lending relationships.

The rest of the paper proceeds as follows. In Section 1 I review the related literature and highlight the contribution of this paper. In Section 2, I discuss theories of relationship lending and their implications for credit terms when borrowers experience distress, which result in several testable hypotheses. In Section 3, I describe the data sources, the various steps to track renegotiations and loan pricing terms over time, and the measurement of the economic variables. In Section 4, I present the results of the empirical analysis and offer an economic interpretation in light of the existing theories. Section 5 offers concluding remarks.

1. Related Literature and Contribution

This paper contributes to several strands of literature. First, it advances our understanding on the benefits and costs of lending relationships. Several studies provide evidence consistent with a beneficial role of relationship lending both in normal times (Berger & Udell, 1995; Bharath et al., 2007, 2011; Dahiya et al., 2021; Degryse & Ongena, 2005; Drucker & Puri, 2005; Petersen & Rajan, 1994; Schenone, 2010) and in times of aggregate distress (Beck et al., 2018; Berlin & Mester, 1999; Bolton et al., 2016; DeYoung et al., 2015; Jiménez et al., 2012; Karolyi, 2018; Sette & Gobbi, 2015). However, there is also some evidence pointing to a less benign side of relationship lending both in normal times (Calomiris & Pornrojnangkool, 2009; Degryse & Cayseele, 2000) and in times of aggregate distress (Berger et al., 2020; Santos & Winton, 2008). A smaller body of works focuses on situations in which borrowers experience distress, mostly in bank-dominated economies such as Germany and Japan (Elsas & Krahnen, 1998; Hoshi et al., 1990; Peek & Rosengren, 2005; Schäfer, 2019). Consistent with the results of this paper, they provide evidence that stronger bank relationships benefit firms when they undergo financial distress.

My results are in contrast with the evidence presented by Li et al. (2019), who also analyze the implications of relationship lending for borrowers in distress in the context of the US syndicated loan market. In particular, I find a beneficial effect of relationship lending on credit terms, whereas they conclude that there are no benefits in this regards. This is due to several important differences in the empirical approach between this paper and their work. First, I include all loan renegotiations in the computation of the measures of relationship lending. This improves on the characterization of relationship lending, since a renegotiation is a direct way to observe the presence of an active lending relationship. Second, I account for state-contingent loan pricing. In presence of differential use of these provisions by relationship and non-relationship lenders, this allows for a more precise counterfactual loan spread as borrowers enter distress. Third, I focus on a broader set of loan terms compared to Li et al. (2019), who do not analyze loan amounts.[7] Fourth, differently from Li et al. (2019), I explicitly account for bank unobserved variation and control for important time-varying drivers of bank matching, such as bank size and bank capital. Fifth, I exploit cross-sectional heterogeneity in borrowers' outside options to discriminate among different economic theories.

This paper also contributes to the literature on loan renegotiations (Berlin & Mester, 1992; Nikolaev, 2018; Roberts, 2015; Roberts & Sufi, 2009b; Xiang, Wang, & Basu, 2021).

7. They also look at the degree of covenant strictness.

While focusing on the outcomes of both new loan originations and renegotiations, this paper develops an algorithm to distinguish originations from renegotiations that allows for a large-sample analysis of renegotiations, similar to Nikolaev (2018). While Nikolaev (2018) obtains information by scraping the credit agreements directly from the SEC filings, I rely on comments in the Dealscan database to classify renegotiations. Moreover, I use this information to construct a pseudo credit register that covers three decades. By looking also at the outcomes renegotiations when borrowers are in distress over a long time sample in the US, this paper complements the study by Papoutsi (2021), who analyzes how relationship lending affects the likelihood and the outcomes of loan renegotiations in Greece against the backdrop of the Greek sovereign debt crisis.

Finally, this paper is broadly related to the literature on financial contracting (see, e.g., Roberts & Sufi, 2009a) and in particular to a smaller, but growing set of studies that focus on performance pricing (Adam & Streitz, 2016; Asquith et al., 2005; Bensoussan, Chevalier-Roignant, & Rivera, 2021; Bhanot & Mello, 2006; Chaigneau, Edmans, & Gottlieb, 2021; Koziol & Lawrenz, 2010; Manso, Strulovici, & Tchistyi, 2010). These studies analyze the rationale and the optimality of state-contingent loan pricing provisions, whereas this paper takes these provisions as given and aims to obtain the actual loan pricing terms implied by these provisions quarter by quarter. To the best of my knowledge, I am the first one to explicitly consider performance pricing provisions in this way.

2. Conceptual Framework & Hypotheses

There is a large empirical and theoretical literature studying relationship lending and its implications for borrowers, in and outside of financial distress. Theoretical work offers sharply different predictions and mechanisms regarding the impact of relationship lending when borrowers experience distress. Below I review these studies and derive testable hypotheses that will be the focus of the empirical analysis.

Theories of *intertemporal smoothing* (Berlin & Mester, 1999; Bolton et al., 2016; Petersen & Rajan, 1995), *implicit commitment and reputational incentives* (Boot et al., 1993; Dinç, 2000), and *borrower hold-up/zombie lending* (Davydenko & Strebulaev, 2007; Hu & Varas, 2021) predict that borrowers receive favorable terms from relationship lenders compared to non-relationship ones.

Studies emphasizing the *continuation value* and *economies of scope* embedded in credit relationships from the lender's perspective (Bharath et al., 2007; Drucker & Puri, 2005; Yasuda,

2005) posit that relationship lenders offer no different terms than other lenders when borrowers are in distress.

Finally, theories of *lender hold-up* (Rajan, 1992; Sharpe, 1990; von Thadden, 1995) predict that borrowers in distress will obtain worse credit terms from relationship lenders relative to other lenders. Below I review these theories and the corresponding testable hypotheses in more detail.

Hypothesis 1: Better Credit Terms in Distress

Intertemporal Smoothing

Allen and Gale (1997), Berlin and Mester (1999), Bolton et al. (2016), and Petersen and Rajan (1995) present models in which banks can accommodate intertemporal smoothing of interest rates on loans through long-term lending relationships.

In Berlin and Mester (1999), banks can insure borrowers against rising interest rates in times of distress thanks to their access to rate-insensitive sources of funding, namely core deposits. In the theories of Allen and Gale (1997) and Petersen and Rajan (1995) relationship lenders can provide intertemporal risk-sharing against firms experiencing shocks to their credit quality, i.e. distress, if they can expect to recoup possible short-term losses with larger long-term benefits. Similarly, Bolton et al. (2016) show, both theoretically and empirically, that lenders provide relatively favorable interest rates to relationship borrowers during times of aggregate distress because they can charge higher rates in normal times.

A crucial role in this class of models is the presence of some degree of ex-post lender's market power over the borrower. In fact, lenders that face high credit market competition cannot provide insurance in bad times because they do not expect to extract rents in good times. Therefore, the *intertemporal smoothing* hypothesis has the following testable predictions along three dimensions – distress times, normal times, and in the cross-section:

H1.A. In *distress*, relationship borrowers obtain *better* terms than non-relationship.

H1.B. In *normal times*, relationship borrowers obtain *worse* terms than non-relationship.

H1.C. The effects are *stronger* for borrowers *with no, or little, outside financing options.*

Implicit Commitment & Reputational Capital

Through repeated interactions with a borrower, relationship lenders can generate information that is proprietary (Bhattacharya & Chiesa, 1995) and reusable (Chan, Greenbaum, & Thakor, 1986). In the presence of economies of scale in information production, the acquisition of information can also generate economies of scope because a relationship lender can offer

loans and other services at a lower cost (Petersen & Rajan, 1994). Boot (2000) concludes that relationship lending allows for the acquisition and the use of subtle, non-contractable information that facilitates implicit, long-term contracting. This implies that relationship lending should provide benefits to borrowers in normal times, in the form of favorable credit terms.

Lenders could keep providing preferential treatment to relationship borrowers even in distress, to honor implicit commitment and to preserve their reputation as relationship lenders, despite incurring in potential losses. Boot et al. (1993) explicitly model the trade-off between financial and reputational capital when lenders need to decide whether to keep financing or not borrowers that experience a material adverse change to their financial conditions. They might want to continue supplying credit even in the presence of losses to financial capital in order to develop a reputation for providing support to borrowers in distress. In turn, a good reputation might attract future lending business from other borrowers. Dinç (2000) also presents a model in which relationship lenders should finance borrowers in distress because of reputational concerns. The *implicit contracting* hypothesis has thus the following testable implications:

H1.A. In *distress*, relationship borrowers obtain *better* terms than non-relationship.

H1.D. In *normal times*, relationship borrowers obtain *better* terms than non-relationship.

H1.E. In *distress*, relationship borrowers obtain *similar* terms than what they would obtain in normal times.

Borrower Hold-Up

Another reason why lenders could grant favorable credit terms in distress is to avoid the costs associated with their borrowers' default or bankruptcy events (Dahiya, Saunders, & Srinivasan, 2003). Lenders, exploiting their role as information producer, might also have the incentive to certify a borrower in distress to increase the chances of future market financing, which would allow the borrower to then repay its loans (Puri, 1999). Dewatripont and Maskin (1995) and Hu and Varas (2021) also present model in which it is optimal for the lender to refinance a borrower experiencing distress. Borrowers internalize this, and can therefore threaten to strategically declare default or file for bankruptcy (Davydenko & Strebulaev, 2007), thereby holding up their relationship lenders and extracting better credit terms while experiencing distress.

According to this view, relationship lenders would provide credit terms that not only are relatively more favorable than non-relationship in distress, but that are more favorable even compared to the terms that would be offered in normal times. The studies by Dahiya et al. (2003) and Drucker and Puri (2005) also suggest that this effect should be more pronounced for larger and less opaque borrowers, because the costs associated to these borrowers' default

would be higher for the lenders. The *borrower hold-up* hypothesis has thus the following testable implications:

H1.A. In *distress*, relationship borrowers obtain *better* terms than non-relationship.

H1.D. In *normal times*, relationship borrowers obtain *better* terms than non-relationship.

H1.F. In *distress*, relationship borrowers obtain *even better* terms than what they would obtain in normal times.

H1.G. The effects are *stronger* for borrowers *with (better) outside financing options.*

Hypothesis 2: Same Credit Terms in Distress

Continuation Value

An alternative possibility is that lenders do not offer any preferential treatment to relationship borrowers in distress. The reason is that the benefit of such course of action might be limited, at best. Bharath et al. (2007), Drucker and Puri (2005), and Yasuda (2005) offer empirical evidence that is consistent with the notion, discussed earlier in the context of implicit contracting, of economies of scope in relationship lending. They document that an important motive behind a lender's choice to engage in relationship lending is the possibility to win future business from its borrowers, in the form of additional loans, investment banking or other fee-generating services. In short, the decision to engage in relationship lending depends on the *continuation value* of a given credit relationship.

When firms experience financial distress, the likelihood of relationship termination increases because of an increased probability of borrower's default. Therefore, the likelihood of attracting future business from that borrower also decrease, and the continuation value of the credit relationship decreases as well. This implies that when borrowers are in distress relationship lending should not imply any difference in credit terms, because from a lender's perspective there is no particular additional benefit from continuing lending to a relationship borrower. The *continuation value* hypothesis has thus the following testable implications:

H2.A. In *distress*, relationship borrowers obtain *same* terms than non-relationship.

H2.B. In *normal times*, relationship borrowers obtain *better* terms than non-relationship.

Hypothesis 3: Worse Credit Terms in Distress

Lender Hold-up

Relationship lending allows lenders to acquire private, "soft" information about the borrowers. Rajan (1992), Sharpe (1990), and von Thadden (1995) present models in which borrowers

cannot transfer this information to other lenders, giving inside banks' informational monopolies over the borrower. This generate an adverse selection problem for borrowers when they seek financing from outside banks because they cannot credibly signal their quality, and they have to pay higher interest rates. Informational monopolies are likely to become even larger in distress, when the borrowers has even less outside financing opportunity. The bargaining power shifts to the lender, which can exploit their market power and hold up their relationship borrowers by granting less favorable credit terms.[8]

A straightforward cross-sectional implication follows: this effect should be more pronounced in the presence of more informationally opaque borrowers, for which the transmission and accumulation of information should be relatively more important, and whose outside financing options in distress should be even more limited. The *lender hold-up* hypothesis therefore has the following predictions:

H3.A. In *distress*, relationship borrowers obtain *worse* terms than non-relationship.

H3.B. In *normal times*, relationship borrowers obtain *worse* terms than non-relationship.

H3.C. The effects are *stronger* for borrowers *with no, or little, outside financing options.*

3. Data & Measurement

To test and discriminate across the rich set of theoretical predictions, I construct a sample of syndicated loans matched with bank and firm characteristics. I also explicitly consider loan amendments, which in principle can be relevant in distress and for accurately measuring the strength of a credit relationship, but have been generally disregarded by most of the literature on relationship lending in the syndicated loan market. Below I describe the data sources and sample selection, discuss the measures of relationship lending, distress, and firm outside options, present the loan outcomes I will focus on in the analysis, and, and summarize the sample characteristics.

3.1. Data Sources and Sample Selection

I obtain information on syndicated loans from Thomson Reuters/Refinitiv Dealscan on WRDS for the time sample 1987 – 2020. Dealscan collects information on two different levels: loan packages, or deals, and loan facilities. A given package generally includes one or more loan

8. Diamond and Rajan (2000) also present a model in which lenders provide less or favorable terms to their borrowers depending on their relative bargaining power. However, in their model, the source of lenders' bargaining power is the presence of low bank capital, which makes banks demand immediate liquidity from their borrowers to prevent a run on deposits.

facilities. Unless otherwise noted, I conduct my analysis at the loan facility level.[9] I limit the sample to all the loan facilities whose borrowers can be matched to Compustat using the linking table provided by Chava and Roberts (2008), and whose lenders can be matched to Compustat Bank using the linking table provided by Schwert (2018). Lenders in Dealscan are matched to the corresponding bank holding company on Compustat Bank, and in case of mergers among lenders I attribute the loans of the merging lenders to the new holding company from the time of the merge onward. The borrower linking table is updated as of mid-2017, therefore I restrict the sample up to 2016Q4.

I further require borrowers to have stock price information available on CRSP and to be incorporated in the US. Following the literature, I drop all financial firms (SIC codes 6000-6999 in Compustat). Since the focus is on borrower financial distress outside of bankruptcy, I drop all facilities whose primary purpose is described as "Debtor-in-Possession". I also drop all non-standard loans, keeping only term loans, revolvers, bridge loans, letters of credit, and other loans.[10,11] Since the main analysis of the paper focus on credit availability and pricing, I drop all the loans that have the variables *FACILITYAMT* or *ALLINDRAWN* missing on Dealscan.[12]

Most loans in Dealscan are syndicated, and therefore each loan will be associated to one or more lead banks, or lead arrangers, and to one or more participant lenders. In line with the literature on lending relationships, I focus only on the lead arrangers (Bharath et al., 2011; Prilmeier, 2016; Schwert, 2018). Lead arrangers are generally in charge of the active management of the loan and of the credit relationship, even if they do not retain the entirety of the loan on their balance sheets (Ivashina, 2009). To distinguish between lead arrangers and participants, I use a similar methodology to Ivashina (2009) and Bharath et al. (2011).[13] Throughout the paper, I focus mainly on loan facilities with a single lead arranger.

9. WRDS has updated the Dealscan dataset starting from the summer of 2021. The update consisted in a reorganization of the entire dataset, combining all the information in a single table and changing loan identifiers. The discussion here is based on a vintage of Dealscan downloaded in August 2020, which was organized around different tables, and is now considered the "legacy" version on WRDS. In particular, I obtain and combine information from the following tables: *FACILITY, PACKAGE, LENDERSHARES, CURRFACPRICING, COMPANY, PERFORMANCEPRICING, FACILITYAMENDMENT, DEALPURPOSECOMMENT*.

10. In particular, I follow Berg, Saunders, and Steffen (2016) in classifying loan facilities as term loans or revolver lines of credit.

11. The results of the paper do not change if I restrict my analysis to term loans and revolvers only.

12. As the emphasis is on idiosyncratic borrower distress, I conduct extensive robustness tests in which I exclude all loan facilities that have a starting date during recessions, as identified by the NBER.

13. In particular, first I check the number of lenders. If there is only one lender, that is considered the lead arranger. In case of multiple lenders, the *LENDERSHARES* table in Dealscan has a field *LENDERROLE* that contains information on the functions performed by the various lenders. A lender that has a role as "Administrative Agent" is considered the lead arranger of the loan. If there is no administrative agent within a syndicate, then I consider lead arrangers those lenders that have one of the following title: "Agent", "Arranger", "Bookrunner", "Lead Arranger", "Lead Bank", "Lead Manager".

Finally, I merge information on loan facilities with borrower characteristics from Compustat and lender characteristics from Compustat Bank. I obtain borrower stock price information from CRSP, on borrowers' bond issuances from Mergent FISD, and on credit ratings from Capital IQ.

3.2. Loan Renegotiations and Amendments

I also collect information on loan renegotiations, amendments, and modifications.[14] These refer to amendments that do not result in new loan agreements – which I call loan modifications – as well as amended and restated agreements, and refinancing/rollovers of existing credit. Accounting for loan renegotiations is important. First, the presence of a loan renegotiation represents direct evidence of an active borrower-lender relationship. Second, loan amendments represent relevant credit events. When borrowers are in distress, lenders might be more likely to amend an existing loan to reflect the new circumstances rather than originate a new one. Disregarding amendments would imply forgoing an important dimension of the data. Third, it is well known that credit agreements are frequently renegotiated (Nikolaev, 2018; Roberts, 2015; Roberts & Sufi, 2009b). Since one goal of this paper is to account for the evolution of the cost of credit over time, accurately tracking renegotiations and changing loan terms, such as the loan spread, is crucial.

Tracking loan amendments is challenging, though. On the one hand, Dealscan keeps track of loan modifications that simply amends an existing agreement without replacing it. On the other hand, however, it generally does not distinguish between newly originated loans and amended and restated loan agreements or rollovers. I proceed as follows. First, I obtain data on loan modifications from the *FACILITYAMENDMENT* table. This contains information on loan facilities that are part of loan packages that are amended. In particular, there is information on possible changes in the loan facility amount, in the spread over LIBOR, the commitment fee, maturity, and few other terms. There are 29,185 loan facilities that are modified according to the *FACILITYAMENDMENT* table. I include in my sample the modifications to loan facilities that satisfy the above-mentioned sample selection criteria, amounting to 10,005 additional loan observations.[15]

14. In this paper I use the terms "amendment" or "renegotiation" interchangeably.
15. There are instances of reported modifications present in the *FACILITYAMENDMENT* table that do not contain observable changes to the facility-level terms reported by Dealscan in this table. From a manual examination of several of these instances, the most likely cause for their inclusion in the table is either the add-on of a facility to the corresponding loan package, or changes in package-level terms. Since the changes at the package level affect each facility, and I cannot rule out that there are unobserved changes to the facility terms, I nonetheless include these modifications in my sample, and consider them in the computation of the measures of relationship lending.

Second, I aim to distinguish newly originated loans from amended and restated credit agreements and rollovers. To this end, I exploit the fact that Dealscan stores a significant amount of textual information in several "comment" fields.[16] A "comment" can include additional information on pricing, the syndication process, the destination of funds, and, more relevant for my purposes, if a given loan amends other loans. A typical example is represented by formulas such as "*Credit amends and restates credit agreement dated DD/MM/YYYY*", even if the information is not *as* standardized in many instances.

To identify amended and restated credit agreement and rollovers, I use regular expressions and search for the following terms "amend", "refinanc", "replac", "restat", "extend", "repric" in the "comment" fields. This gives me a set of potential loan renegotiations and amendments. However, there can be many false positives, and most importantly, a simple search of terms does not provide any indication as to which loans are amended. To determine which loan agreements are effectively amending other loans present in Dealscan, I develop a text-scraping algorithm that parses many pieces of information from the "comment" fields. In particular, using regular expressions, I search and parse information on dates, loan types, loan amounts. Then, I search for any loan facility in Dealscan that matches these characteristics – loan starting date, amount, loan type. If a match is found, the corresponding package is flagged as a loan renegotiation, and the amended facility is considered as not outstanding anymore beginning from the starting date of the corresponding package. I find that more than 27,000 loan packages represent a renegotiation of a previous credit agreement in Dealscan. After applying the sample selection criteria, there are 10,005 loan facilities in my sample that represent renegotiations of existing loan facilities, out of 21,039.

Using this information I construct a pseudo credit register at the loan facility-quarter level, in which I can observe which facilities are currently outstanding at any given moment in time. This allows me to observe if a loan is renegotiated in a given quarter, the loan amount available to firms over time, and which loan terms borrowers effectively face each quarter.

3.3. Measurement of Economic Variables

3.3.1. Relationship Lending

I follow previous research on relationship lending in the syndicated loan market to define the strength of the relationship between a lead bank and a borrower (Bharath et al., 2007, 2011; Li et al., 2019; Prilmeier, 2016; Schenone, 2010). One important distinction compared to previous studies is that I explicitly account for all events of loan renegotiation tracked by

16. In particular, I focus on the *DEALPURPOSECOMMENT* field of the *DEALPURPOSECOMMENT* table, and the *COMMENT* fields of the *FACILITYAMENDMENT, DEALAMENDMENT, FACILITY,* and *PACKAGE* tables.

Dealscan when computing measures of relationship lending. As mentioned, the presence of a loan renegotiation is direct evidence of an active borrower-lender credit relationship.

I construct three measures at the loan level, for a given borrower-lender pair. The main one captures the strength of the credit relationship at the intensive margin. In particular, *Relationship* is defined as the fraction of the number of new loans or loan amendments the borrower obtained from the current lender over the total number of loans and loan amendments obtained from any lender over a five-year window preceding the current loan event – which could be a new loan or a renegotiation itself.

$$\begin{aligned} &Relationship_{b,f,t} \\ &\quad = \frac{\text{Number of new loans/renegotiations between bank } b \text{ and firm } f \text{ from } t-5 \text{ to } t}{\text{Total number of new loans/renegotiations by firm } f \text{ from } t-5 \text{ to } t} \end{aligned}$$

The other two are defined as follows. The first, *Relationship ($ Amt)* is similarly defined as the fraction of the amount of credit the borrower obtained from the current lender over the total credit granted by any lenders over the 5-year window preceding the current loan. Intuitively, this measure weights the number of interactions between borrowers and lenders by the loan facility amount.

$$Relationship\ (\$\ Amt)_{b,f,t} = \frac{\text{Amount of credit from bank } b \text{ to firm } f \text{ from } t-5 \text{ to } t}{\text{Total amount of credit obtained by firm } f \text{ from } t-5 \text{ to } t}$$

The second, $\mathbb{I}(REL)$, captures the extensive margin, and the extent to which a credit relationship is still ongoing over time. It is a dummy variable that takes value 1 if the lender and borrower entered a credit agreement or a renegotiation in the 5 years preceding the current loan and 0 if the borrower entered any credit relationship in the same 5-year window, but not with the same lender of the current loan.

Following Bharath et al. (2011) I require the presence of at least one new loan or loan renegotiation in the five-year window preceding a given loan for the measures of relationship lending to be defined. If this condition is not met, the relationship measures are set to missing for that loan, which is thus excluded from the sample.[17] Also, in the presence of multiple lead arrangers, I define each variable as the maximum value of each variable over the individual borrower-lender pairs.

17. See Bharath et al. (2011, footnote 11, pag. 1153).

3.3.2. Financial Distress

To measure financial distress, I employ an estimate of borrower default probability based on the Merton model of credit risk (Merton, 1974). This is likely to capture the actual indicator lenders use to assess their own borrowers' credit status, as the Merton model represents the foundation underlying a leading industry measure of credit risk, the proprietary Moody's KMV EDF.

In particular, a firm is considered in distress in a given month if during the preceding 12-month period its expected default probability (EDF) is in the top quartile of the distribution of monthly EDFs for 6 or more months, following an approach similar to Li et al. (2019). The EDF is computed employing the "naive" approach described by Bharath and Shumway (2008), which has the desirable property of performing similarly to the measure computed using the original approach of Merton (1974) in predicting firm default, with lower computational requirements regarding numerical estimation. Specifically, following Bharath and Shumway (2008), the EDF is defined for each firm-month pair as follows:

$$EDF = \mathcal{N}\left(-\frac{\ln[(E+D)/D] + \left(r - 0.5\sigma_V^2\right)T}{\sigma_V\sqrt{T}}\right)$$

in which $\mathcal{N}(\cdot)$ is the cumulative standard normal distribution function, E is the market value of the firm's equity, F is the face value of the firm's debt, r is the firm's stock return over the previous 12-month period, $\sigma_V = [E/(E+F)]\sigma_E + [F/(E+F)](0.05 + 0.25\sigma_E)$, and σ_E is the volatility of the firm's equity estimated using daily stock returns data over the previous 12 months (Bharath & Shumway, 2008).

In particular, I compute the EDF for each firm in the universe of the CRSP/Compustat database at the monthly level over the full time sample under consideration (1986-2016). I then consider the 75th percentile of the resulting distribution as the threshold above which a firm can be considered in distress.[18] The resulting variable is a dummy $\mathbb{I}(Distress)$ that takes value 1 for a given firm-month if the number of months in which its monthly EDF is in the top quartile of the distribution of all firm-months is equal or greater than six. Note that the distribution is not limited to the firm-months associated with the loan facilities satisfying the sample selection criteria described in Section 3.1.

18. In robustness tests I also consider the 70th, 80th, and 90th percentiles of the same distribution as thresholds, as well as the Altman Z-Score as an alternative measure of firm distress.

3.3.3. Firms' Outside Options

Borrowers" outside options play an important role in theories of relationship lending. To measure firms' outside options I use three proxies. The first proxy is the access to public bond markets. Firms that issue bonds are likely to have a broader menu of financing options, and more public information available to market participants through the market price of their bonds and the analysis of their underwriters (Hale & Santos, 2009; Santos & Winton, 2008). I therefore classify firms as either bond issuers or not depending on whether they ever issued a public bond. Formally, I define $\mathbb{I}(PBOND)$, which takes value 1 if the firm has ever issued a public bond before taking out a loan and 0 otherwise.[19]

A potential issue with this proxy is the possibility that a firm issued a public bond a long time before taking out a loan, and therefore it might have lost access to the public bond market, or that the public information thereby generated about the firm does not accurately reflect the underlying condition of the firm anymore. To address this concern, I also consider whether firms recently issued a public bond or not a second proxy. The idea is to capture the degree of availability of recent public information about a firm. Formally, I define $\mathbb{I}(PBOND3Y)$, which is a dummy variable that takes value 1 if the firm has issued at least one public bond in the three years preceding a loan, following Santos and Winton (2019). To capture access to the bond market in general, either public or private, I also define the variable $\mathbb{I}(BOND)$, which takes value 1 if the firm has ever issues a bond, either as a private placement or on public debt markets.

3.3.4. Loan Outcomes

To study if relationship lending is beneficial to borrowers when they experience idiosyncratic financial distress, I consider several loan outcomes. Loans are multi-dimensional objects and to fully characterize the implications for borrowers it is important to keep a holistic approach. The first one is the quantity of credit available to borrowers, defined as "Log(Loan Amount)". This is meant to capture benefits at the extensive margin, and either corresponds to the loan facility amount at origination or the quantity of credit that is observed as a result of an amendment or modification. As described in Section 3.2, I track the credit amount available to firms by assuming that the loan is outstanding until maturity or is amended by another loan agreement or modification.

The second one is the cost of credit, which is the focus of most theoretical work. Following the vast majority of empirical literature, I use the "All-In Drawn Spread" as the baseline measure

19. In principle I would like to observe whether a firm has the possibility of issuing a public bond even in absence of an actual issuance, but this is obviously not available to a researcher.

of cost. This captures the cost of the drawn part of the credit, being calculated as the sum of the loan spread over LIBOR and the annual facility fee. I also consider the "All-In Undrawn Spread", which measures the cost on the undrawn, but committed, part of credit, being calculated as the sum of the annual facility fee and the commitment fee.

I track the cost of credit over the lifetime of a loan by explicitly accounting for loan modifications and the performance pricing (PP) grids embedded in loan contracts. Each loan modification contains information on the updated spread over LIBOR and the commitment fee. Each PP grid specifies a step-wise function that maps the the level of certain accounting variables or the borrower's credit rating to the level of the spread over LIBOR, the annual fee, the commitment fee, and other fees.[20] In particular, the vast majority of the PP grids tie the cost of credit to either the Debt-to-EBITDA ("Total Debt to Cash Flow" in Dealscan) ratio (43 %) or to the credit rating assigned by S&P (30 %).[21] To infer the cost of a loan through time, I obtain for each firm-quarter the value of the relevant underlying accounting variables from Compustat, such as the Debt-to-EBITDA ratio. Then, I check to which "step" in the PP grid this value falls. I then assign to that loan-quarter pair the loan spread or the fee specified by that "step" in the PP grid. I do this for all the loans with a single PP grid, and whose PP grid is specified on the credit rating or the accounting variables that I can reasonably map to a variable that can be computed using the quarterly version of Compustat.

The other two outcomes I consider are given by the likelihood of collateral requirements and the level of upfront fees. The presence of collateral requirements is an important aspect of the financing process, as during distress borrowers could experience a deterioration in the market/resale value of their pledgeable assets. To measure this aspect, I define the variable $\mathbb{I}(Collateral)$, which takes value 1 if the *SECURED* variable in Dealscan is equal to "Yes" and 0 if the same variable is equal to "No". Upfront fees are the fees paid by the borrower at the moment of loan originations, and represent an additional margin of loan pricing. To measure them, I consider the related variable on Dealscan.

3.4. Sample Characteristics

The final sample contains 31,619 loan observations, including 21,039 loans that appear as new loans in Dealscan, and 10,580 observations that appear as loan modifications. According to my analysis, of those 21,039 loan observations, 10,005 represent instances of renegotiations – either as amendments, restatements, or refinancing. Table 1 describes the variables used in the

20. Information on PP grids can be found in the *PERFORMANCEPRICING* table in Dealscan.
21. Other commonly used variables include: Leverage (6%), Senior Debt to EBITDA (3%), Maturity (3%), Interest Coverage Ratio (2%), etc. . Also see: Adam and Streitz (2016); Asquith et al. (2005).

analysis, Table 2 presents the sample characteristics of the loan events present in the sample, as well as the borrower and lender characteristics.

4. Empirical Analysis

In this section I perform an empirical analysis on the hypotheses discussed in Section 2. I start by presenting evidence on the use of performance pricing and likelihood of loan modification that motivates the use of a pseudo credit register in lieu of the standard dataset based on loan events only. I then document that relationship lending provide benefits to borrowers in distress in the form of higher credit availability and lower spreads on the drawn amount of credit. This effect is not compensated by an increase in the fees on the undrawn credit amount, by an increased likelihood to require collateral or by increased upfront fees. This evidence is consistent with the hypotheses predicting relationship lending providing favorable terms in distress. To discriminate among different possible explanations and better understand the underlying economic mechanisms, I repeat the analysis over subsamples of borrowers differing in their outside financing options. I show that firms benefit from relationship lenders irrespectively of their outside financing options, providing support to theories emphasizing implicit commitment and reputational capital. However, the benefits vary qualitatively across firms: firms with access to public debt markets benefit mainly in terms of credit quantity, firms without benefit mainly from pricing terms.

4.1. The Need for a Pseudo Credit Register

As described in Sections 3.2 and 3.3.4, I construct a pseudo credit register that tracks loan availability and loan pricing over time to overcome two related issues. The first issue arises because loans are frequently renegotiated (Nikolaev, 2018; Roberts, 2015; Roberts & Sufi, 2009b). This implies that loan terms and conditions changes even in absence of a new loan origination. The second issue emerges because a large fraction of loan contracts include performance pricing grids, which tie the cost of credit – including the loan spread and various fees – to the underlying borrowers' performance. Therefore, the cost of credit a firm faces may vary even in absence of a new loan origination or a loan amendment.

Moreover, the presence of a performance pricing grid in credit agreements reduces the probability that the loan will be renegotiated (Asquith et al., 2005; Nikolaev, 2018). In other words, the presence of performance pricing provisions reduces the occurrence of loan events that are observable by the researcher, even if the cost of credit is potentially changing. This

issue is relevant because I show that that relationship lending is negatively correlated with the use of performance pricing provisions. In particular, Table 3 shows that relationship lenders are less likely to include a performance pricing grid by 3.5%. This is consistent with the results of (Adam & Streitz, 2016). The implication of these evidence taken together implies that failing to account for changing credit terms would give rise to a measurement bias. Hence, I conduct my regression analyses using this pseudo credit register to alleviate these issues.

In the next section I turn to the description of the empirical approach.

4.2. The Effect of Relationship Lending during Borrower Distress

Theories of relationship lending has several implications for loan outcomes in normal times, in distress, and across different types of borrowers. Here I focus on the first two aspects, examining later the predictions about heterogeneity in the cross section. I start by regressing several loan outcomes on measures of relationship lending, distress, and their interaction term.

$$\begin{aligned} \textit{Loan Outcome}_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(\textit{Distress})_{f,t-1} + \beta_R \cdot \textit{Relationship}_{b,f,t} \\ + \beta_{RD} \cdot \textit{Relationship}_{b,f,t} * \mathbb{I}(\textit{Distress})_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t} \end{aligned} \tag{1}$$

The dependent variable $\textit{Loan Outcome}_{b,f,t}$ represents different loan outcomes that aim to holistically capture several aspects of the credit relationship. In particular, I use the following as dependent variable: i) "Log(Loan Amount)" to investigate the effects of relationship lending on borrowers' credit availability; ii) "All-In Drawn Spread" and "All-In Undrawn Spread" to study the implications on the cost of credit; iii) $\mathbb{I}(\textit{Collateral})$ to understand the effects on collateral requirements; iv) "Upfront Fee" to obtain insights on an additional dimension of loan pricing.[22]

The main independent variables are $\mathbb{I}(\textit{Distress})_{f,t-1}$, defined in Section 3.3.2 and computed monthly for each firm in the sample, $\textit{Relationship}_{b,f,t}$, which is one of the three measures of relationship lending defined at the loan level in Section 3.3.1, and their interaction term. β_D captures the difference between non-relationship loans in normal times and in distress, β_R captures the difference between relationship loans and non-relationship loans in normal times, and β_{RD} measures the difference between relationship loans in normal times and in distress.

The key economic object of interest is the difference between relationship loan outcomes in distress and non-relationship loan outcomes in distress, which is given by the sum of $\beta_R + \beta_{RD}$. A positive coefficient for the analysis on the cost of credit and collateral requirement will be

22. I conduct the baseline analysis for the first outcomes terms using the pseudo credit register I assembled because I can observe changes due to loan modifications or to performance pricing grids. I conduct the analysis for the collateral and the upfront fee at the loan origination level only because I cannot observe variations in these terms over time.

interpreted as evidence of worse credit terms in distress. Viceversa, a negative coefficient for the analysis on the cost of credit and collateral requirement will be interpreted as evidence of better credit terms in distress. A zero coefficient will be interpreted as evidence of same credit terms in distress. This is the main focus of the paper. However, to fully discriminate among different theories, the coefficients β_R and β_{RD} considered separately might also be important, and will also be discussed.

In all regressions, I include year-quarter fixed effects to control for changing macroeconomic conditions and account for potentially different moments in the business cycle.[23] I control for a series of firm characteristics, such as credit rating dummies, size, leverage, profitability, cash-flow, liquidity, tangibility, firm age, investment opportunities, to alleviate the impact of omitted variables that could be correlated with the relationship status and the outcomes of interest. To account for the non-random matching between banks and firms, I include borrower fixed effects and lender fixed effects, which control for unobserved heterogeneity at the firm and bank level that could drive the matching. I also include bank size and bank capital; the latter represents an important time-varying driver of bank-firm matching, as documented by Schwert (2018). Lender fixed effects are also important to control for potential heterogeneous bank business models – i.e. transactional vs relationship lending – that could be correlated with both loan outcomes and relationship status. Finally, I also control for loan-level characteristics, such as loan purpose, loan type, the presence of a performance pricing grid, and the number of lenders in the syndicate.

4.2.1. Results

The results of the analysis are reported in Table 4 and Table 5. Relationship lending implies higher credit availability in distress, lower spreads on the drawn credit, no higher fees on the undrawn credit or to be paid upfront, and no higher collateral requirements.

I first examine the impact of relationship lending on the amount of credit made available to the borrowers. This a natural outcome to look at since when a borrower is in distress is likely to experience higher liquidity needs than normal times, and likely represent the most relevant dimension of a credit relationship. Table 4 presents the results in columns 1 and 2, obtained from a regression following the specification described in Equation (1). The estimates for the net effect of relationship lending in distress are both economically and statistically significant, and are relatively similar across specifications with and without lender fixed effects. To interpret the estimates, a back-of-the-envelope calculation implies that a one standard-deviation increase in the measure of relationship lending implies a higher credit availability for borrowers in

23. Note that, as mentioned in Section 3.1, I drop all loan observations that occur during a NBER recession.

distress by approximately $18M for the average loan.

I then proceed to examine the implications of relationship lending on the cost of credit, using two measures. The first one is the cost of drawn credit, given by the All-In Drawn Spread, which is the focus of the great majority of the extant empirical and theoretical literature on relationship lending. The second one is the cost of undrawn credit, given by the All-In Undrawn Spread. Columns 3 and 4 of Table 4 report the results of the analysis for the All-In Drawn Spread. Lenders charge their relationship borrowers with lower interest rates spread when in distress. The estimates are again economically and statistically significant. A one standard-deviation increase in the measure of relationship lending implies a lower All-In Dawn Spread by 4 basis points, which represent a saving up to $600,000 dollars over the lifetime of the average loan. Columns 5 and 6 report the estimates for the effect on the All-In Undrawn Spread, which are not statistically different from zero. Importantly, these estimates imply that the benefits in terms of higher credit availability and lower spreads are not compensated by a higher fee on the committed, undrawn amounts.

Finally, I examine if in exchange for these benefits lenders are more likely to require collateral or charge higher upfront fees to their relationship borrowers. The results of the analysis for these two variables are reported, respectively, in columns 1 and 2, and 3 and 4 of Table 5. The evidence strongly rules out that lenders require higher collateral, as the point estimates are negative, though indistinguishable from zero. The coefficients on the upfront fees are positive, yet statistically insignificant. This could be due to the low power of the test given the low number of non-missing observation of the corresponding variable in Dealscan. The positive coefficient suggests that lenders might use higher upfront fees to compensate for the insurance provision in distress, but the limited number of observation does not allow to properly test this hypothesis.

Overall, the evidence points to a beneficial effect of relationship lending when borrowers are in distress, which rules out the *continuation value* and the *lender hold-up* hypotheses, and provides support to theories that posits insurance provisions in distress.

4.2.2. Robustness Tests

The evidence is robust to a series of robustness tests. Table 6 shows that the main results are robust to employing the alternative measures of relationship lending presented in Section 3.3.1. Table 7 presents the results of the main analysis augmenting the baseline specification with borrower×time and lender×time fixed effects. The effects of relationship lending continue to be economically and statistically significant. This alleviates concerns that differential firm demand or differential bank supply drive the observed effects. Table 8 shows that the results

are not sensitive to the specific definition of distress employed in the main analysis. Specifically, repeating the analysis using different thresholds (70th, 80th, and 90th percentile) or the Altman Z-Score (Altman, 1968) to define distress does not change the results of the analysis.[24] Table 9 confirms the main results over the larger sample that includes also loans with multiple lead arrangers.

While the pseudo credit register I assembled has several advantages over a standard dataset that includes only terms observed in the presence of a loan event, there is a concern that measurement error in tracking loan renegotiations and credit terms over time could drive my results. Measurement error could arise from prepayment of loans or unobserved amortized repayment over time, for example. To alleviate the concern that measurement error in tracking credit terms over time is the driving factor behind my results, I perform two tests. First, I repeat my analysis only using observations corresponding to the quarters in which I observe a loan origination or renegotiation. Table 10 reports the results of this exercise, and the economic message is unchanged. Relationship lending is beneficial for borrowers in distress. Secon, I repeat my analysis for the stand-alone pricing terms that are actually specified in the performance pricing grids, without further aggregations that could imply measurement error in the All-In Drawn and Undrawn spreads. The estimates displayed in Table 11 confirm the baseline results.

Finally, as the emphasis of the paper is on situations of idiosyncratic financial distress, in Appendix B I repeat the full analysis by excluding periods of aggregate distress, as proxied by the NBER recessions. The results are quantitatively very similar.

4.3. The Role of Borrowers' Outside Options

The evidence presented in the previous section appears to align most closely with theories of implicit commitment and reputational capital in lending relationships. However, to fully discriminate among the different theories that predict benefits for relationship borrowers in distress, I now examine whether, and how, the effect of relationship lending varies depending on borrowers' outside financing options. These play a key role in theories of relationship lending because they are closely related to the degree of available public information about the borrower,

24. The estimate for the net effect of relationship lending on the All-In Drawn Spread when using the 90th percentile to define distress and lender fixed effects is not statistically significant at any conventional values—the *p*-value, unreported, is 0.109. This could be due to either a lower within-bank variation in the measure of relationship lending given the lower number of observations in distress due to the higher threshold, or reflect a weakening of the effect of relationship lending as the distress gets more severe. However, the relatively similar estimates on the net effect of relationship lending on loan amounts and pricing terms make the former explanation more likely.

and they determine the relative bargaining power in the credit relationship.

I repeat my analysis for the main three loan outcomes over subsamples of borrowers reasonably characterized by different degrees of outside financing options and informational opacity, using the different measures described in Section 3.3.3. In particular, the one I consider more economically relevant is whether a firm has access to public bond markets. **??** present the results of the subsample analysis. Overall, borrowers with access to bond financing experiences benefits mainly in the form of higher credit availability, whereas borrowers without benefit mainly from lower interest rate spreads on drawn credit. These benefits are not compensated by a higher All-In Undrawn Spread for either group of firms.

Despite being qualitatively different, the benefits of relationship lending accrue to borrowers irrespectively of their outside financing options. These results are in line with the theories of *implicit commitment & reputational capital*, in which banks offer better terms to borrowers and keep offering those terms even in distress to develop a reputation that in turn should allow them to win future business.

5. Conclusion

In this paper I study whether relationship lending can help borrowers mitigate the costs of idiosyncratic financial distress, which can be sizable. I first present the empirical challenge presented by the differential use of performance pricing grids in loan contracts by relationship lenders and non-relationship lenders, and by how that affects the loan events that can be actually observed in a "standard" dataset. To address these issues, I construct a novel dataset that results into a pseudo credit register that track credit quantity and price over time, by accounting for loan amendments and modifications and for state-contingent loan pricing provisions. I then use this dataset to compare the credit terms by relationship lenders and non-relationship lenders in distress, employing a within-firm approach. By employing a measure of relationship lending that accounts for loan modifications – a novelty in the literature – I find strong evidence of lenders providing favorable terms to their relationship borrowers in distress, in the form of higher credit amount and lower interest rate spreads. These benefits are qualitatively different in the cross section of borrowers' outside options. In contrast with the findings of Li et al. (2019), I provide evidence supporting theories of implicit commitment and reputational capital.

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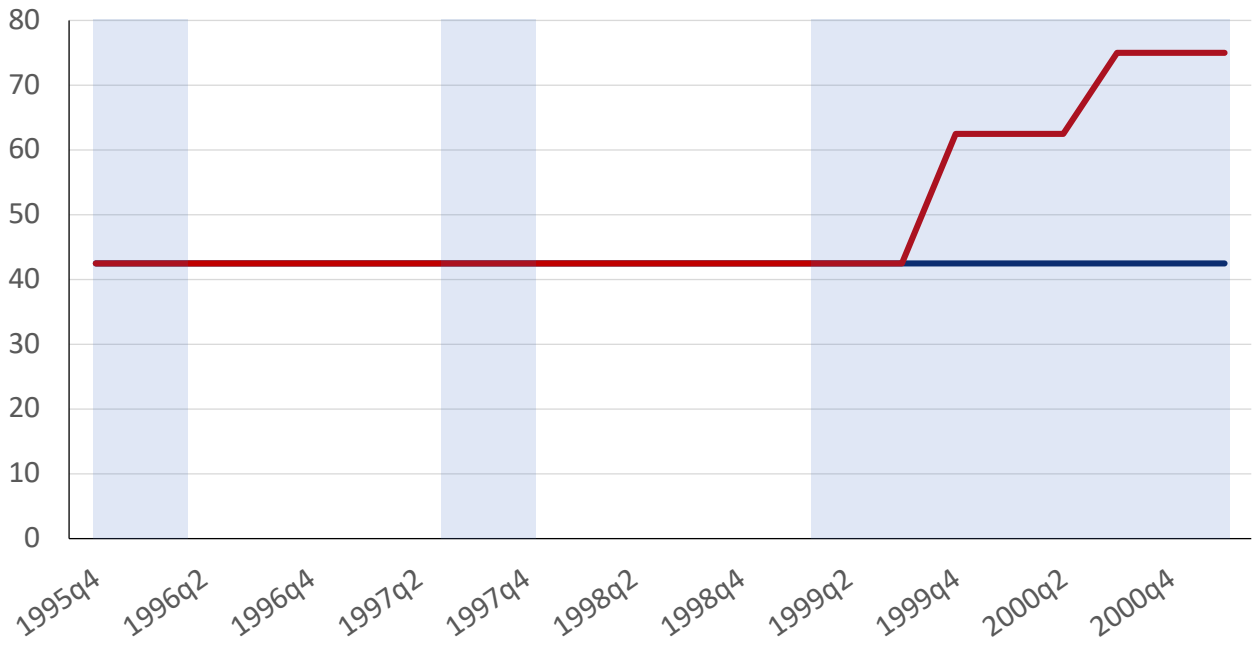
A. Tables and Figures

Figure 1. An Example of State-Contingent Loan Pricing



The figure represents the difference between the level of the All-In Drawn Spread (AISD) at origination (blue line) and the AISD implied by the performance pricing grid (red line) over the lifetime of a revolver credit facility that was issued on November 8, 1995 to Burlington Industries (Dealscan *facilityid* 35978). The performance pricing grid is based on the S&P Lon Term Issuer Credit Rating. The shaded areas represent quarters of financial distress according to the measure described in Section 3.3.2.

Table 1. Variable Definition

Variable Name	Definition	Data Source
Borrower		
Ln(Assets)	Ln(atq)	Compustat
Book Leverage	(dlttq + dlcq)/atq	Compustat
Liquidity	cheq/atq	Compustat
Profitability	oibdpq/atq	Compustat
Cash Flows	$\text{Ln}\left[1 + \frac{\text{rolling 4-qtr sum of oibdpq}}{\text{dlttq + dlcq}}\right]$	Compustat
Tangibility	ppentq/atq	Compustat
Market-to-Book	(prccq × cshoq + atq - ceqq)/atq	Compustat
$\mathbb{I}$(Credit Rating)	Equal to 1 if ltrf = 1, 0 otherwise	Capital IQ
EDF	Described in Section 3.3.2	CRSP/Compustat
Years since IPO	Current date minus first date in Compustat	Compustat
$\mathbb{I}(PBOND)$	Described in Section 3.3.3	Mergent FISD
$\mathbb{I}(PBOND3Y)$	Described in Section 3.3.3	Mergent FISD
Loan		
Relationship	Described in Section 3.3.1	Dealscan
Relationship ($ Amt)	Described in Section 3.3.1	Dealscan
$\mathbb{I}(REL)$	Described in Section 3.3.1	Dealscan
Loan Amount ($M)	facilityamt/1e6	Dealscan
Loan Spread	Fee (over libor) charged per $ of drawn credit (fac_maxbps)	Dealscan
Commitment Fee	Fee charged per $ of undrawn credit (commitment)	Dealscan
Annual Fee	Fee charged annually per total credit amount (annual_fee)	Dealscan
All-In Drawn Spread	Loan Spread + Annual Fee	Dealscan
All-In Undrawn Spread	Commitment Fee + Annual Fee	Dealscan
Maturity (Months)	maturity	Dealscan
$\mathbb{I}$(Collateral)	Equal to 1 if secured = "Yes", 0 otherwise	Dealscan
Upfront Fee	One-time fee paid to lenders (upfront_fee)	Dealscan
N. Lenders	N. syndicate members	Dealscan
$\mathbb{I}$(PP)	Equal to 1 if loan includes perf. pricing (PP) grid, 0 otherwise	Dealscan
$\mathbb{I}$(PP - Pred. Decr.)	Equal to 1 if orig. spread closer to PP-grid max spread than min	Dealscan
$\mathbb{I}$(PP - Pred. Incr.)	Equal to 1 if orig. spread closer to PP-grid min spread than max	Dealscan
$\mathbb{I}$(Revolver)	Equal to 1 if loan is a revolver (Berg et al., 2016, see p.1382)	Dealscan
$\mathbb{I}$(Term Loan)	Equal to 1 if loan is a term loan (Berg et al., 2016, see p.1382)	Dealscan
$\mathbb{I}$(Corp. Purposes)	Equal to 1 if primarypurpose = "Corp. Purposes"	Dealscan
$\mathbb{I}$(Debt Repay.)	Equal to 1 if primarypurpose = "Debt Repay."	Dealscan
$\mathbb{I}$(Work. Capital)	Equal to 1 if primarypurpose = "Work. Capital"	Dealscan
$\mathbb{I}$(Takeover)	Equal to 1 if primarypurpose = "Takeover"	Dealscan
Lender		
Ln(Bank Assets)	Ln(atq)	Compustat
Bank Capital (Book)	ceqq/atq × 100	Compustat
Bank Capital (Mkt)	(prccq × cshoq)/(atq - ceqq+ prccq × cshoq) × 100	Compustat

Table 2. Sample Characteristics

	Mean	S.D.	25th pct	Median	75th pct	Unique Obs.
Borrower Characteristics (Unique Borrowers: 3,076)						
Ln(Assets)	7.12	1.69	5.95	7.07	8.25	19,178
Book Leverage	0.33	0.20	0.20	0.31	0.43	19,178
Liquidity	0.07	0.09	0.01	0.03	0.08	19,178
Profitability	0.03	0.03	0.02	0.03	0.05	19,178
Cash Flows	0.49	0.60	0.20	0.33	0.55	19,178
Tangibility	0.35	0.25	0.14	0.28	0.54	19,178
Market-to-Book	1.63	0.81	1.12	1.39	1.85	19,178
$\mathbb{I}$(Credit Rating)	0.50	0.50	0.00	0.00	1.00	19,178
EDF	0.07	0.19	0.00	0.00	0.01	18,454
Years since IPO	20.18	16.41	6.64	15.21	31.73	19,178
$\mathbb{I}(PBOND)$	0.49	0.50	0.00	0.00	1.00	19,178
$\mathbb{I}(PBOND3Y)$	0.32	0.47	0.00	0.00	1.00	19,178
Loan Characteristics (Unique Loans: 21,039 – Modifications: 10,580)						
Relationship	0.65	0.38	0.33	0.75	1.00	31,619
Relationship ($ Amt)	0.69	0.38	0.38	0.90	1.00	31,619
$\mathbb{I}(REL)$	0.85	0.35	1.00	1.00	1.00	31,619
Loan Amount ($M)	354.35	524.66	55.00	165.00	400.00	31,619
All-In Drawn Spread	207.57	125.01	120.00	200.00	275.00	31,619
Maturity (Months)	45.35	21.95	29.00	48.00	60.00	30,981
All-In Undrawn Spread	32.02	21.58	15.00	27.50	50.00	19,351
$\mathbb{I}$(Collateral)	0.71	0.45	0.00	1.00	1.00	14,964
Upfront Fee	8.42	27.38	0.00	0.00	0.00	19,422
N. Lenders	8.80	8.47	3.00	7.00	12.00	21,039
$\mathbb{I}$(PP)	0.47	0.50	0.00	0.00	1.00	21,039
$\mathbb{I}$(PP - Pred. Decr.)	0.21	0.41	0.00	0.00	0.00	21,039
$\mathbb{I}$(PP - Pred. Incr.)	0.25	0.43	0.00	0.00	1.00	21,039
$\mathbb{I}$(Revolver)	0.69	0.46	0.00	1.00	1.00	21,039
$\mathbb{I}$(Term Loan)	0.28	0.45	0.00	0.00	1.00	21,039
$\mathbb{I}$(Corp. Purposes)	0.42	0.49	0.00	0.00	1.00	21,039
$\mathbb{I}$(Debt Repayment)	0.14	0.35	0.00	0.00	0.00	21,039
$\mathbb{I}$(Work. Capital)	0.15	0.36	0.00	0.00	0.00	21,039
$\mathbb{I}$(Takeover)	0.11	0.31	0.00	0.00	0.00	21,039
Lender Characteristics (Unique Lenders: 96)						
Ln(Bank Assets)	12.28	1.52	11.19	12.33	13.51	3,130
Bank Capital (Book, %)	7.33	2.67	5.25	7.59	9.10	3,130
Bank Capital (Mkt, %)	12.12	6.19	7.41	11.50	15.97	2,946

Table 3. The effect of relationship lending on the use of performance pricing provisions

	Dependent Variable: $\mathbb{I}$(PP)	
	(1)	(2)
Relationship	$-.0351^{***}$	$-.0382^{***}$
	(-2.76)	(-2.95)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*
Lender FE	*No*	*Yes*
Adj. R Sq.	.365	.372
Obs.	19,946	19,942

This table reports the estimates of the coefficients from the following regression over the sample of loan observations from the Dealscan main table, not including the loan modifications:

$$\mathbb{I}(PP)_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta \cdot Relationship_{b,f,t} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $\mathbb{I}(PP)_{b,f,t}$ is a dummy that takes value 1 if a loan granted by lender b to borrower f at time t specifies a performance pricing grid. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the given loan observation. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, and the number of syndicate participants. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 4. The effect of relationship lending on loan amount and pricing in distress

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0779***	.0779***	3.838	3.495	.6064	.4664
	(2.90)	(3.00)	(1.36)	(1.28)	(0.88)	(0.68)
Relationship	.2284***	.2117***	−21.39***	−19.79***	−2.681***	−2.634***
	(6.55)	(6.27)	(−7.29)	(−6.95)	(−3.68)	(−3.62)
$Relationship * \mathbb{I}(Distress)$	−.0981***	−.095***	9.696**	10.05**	1.532	1.713*
	(−2.71)	(−2.70)	(2.40)	(2.55)	(1.54)	(1.74)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.72	.725	.646	.655	.626	.629
Obs.	383,273	383,273	383,273	383,273	229,659	229,657
Net Effect $(\beta_R + \beta_{RD})$	.13***	.117***	−11.7**	−9.74**	−1.15	−.921
F-Stat	9.54	8.14	6.45	4.64	1.01	.668

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 5. The effect of relationship lending on other credit terms in distress

	$\mathbb{I}$(COLLATERAL)		UPFRONT FEE	
	(1)	(2)	(3)	(4)
$\mathbb{I}(Distress)$	.014	.0122	4.366	3.169
	(0.97)	(0.84)	(0.52)	(0.39)
Relationship	$-.0425^{***}$	$-.0365^{***}$	-9.102^{*}	-7.479
	(-3.68)	(-3.08)	(-1.92)	(-1.59)
$Relationship * \mathbb{I}(Distress)$	.0169	.0226	15.14	16.53
	(0.91)	(1.20)	(1.30)	(1.38)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.678	.684	.509	.533
Obs.	14,764	14,757	3,025	3,018
Net Effect $(\beta_R + \beta_{RD})$	$-.026$	$-.014$	6.04	9.05
F-Stat	2.63	.725	.278	.599

This table reports the estimates of the coefficients from the following regression over the sample of loan observations from the Dealscan main table, not including the loan modifications:

$$\begin{aligned} Loan\ Outcome_{b,f,t} = \ & \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \\ & \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t} \end{aligned}$$

in which $Loan\ Outcome_{b,f,t}$ is either $\mathbb{I}$(COLLATERAL) or UPFRONT FEE for a loan granted by lender b to borrower f at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over the rolling 12-month window preceding the given loan observation. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the given loan observation. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 6. Robustness: Alternative measures of relationship lending

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Relationship ($ Amt)	.331***	.311***	−26.58***	−24.79***	−2.832***	−2.775***
	(8.90)	(8.69)	(−9.08)	(−8.80)	(−4.13)	(−4.06)
Relationship ($ Amt) $*$ $\mathbb{I}$(*Distress*)	−.1362***	−.1293***	12.91***	12.91***	1.665*	1.836*
	(−3.51)	(−3.44)	(3.29)	(3.38)	(1.74)	(1.94)
Adj. R Sq.	.722	.727	.648	.657	.626	.629
Obs.	383,273	383,273	383,273	383,273	229,659	229,657
Net Effect $(\beta_R + \beta_{RD})$	.195***	.182***	−13.7***	−11.9***	−1.17	−.938
F-Stat	20.9	19.3	10.2	7.98	1.12	.747
Panel B						
$\mathbb{I}(REL)$	.2233***	.2073***	−17.94***	−16.68***	−2.622***	−2.544***
	(7.00)	(6.93)	(−6.90)	(−6.60)	(−3.96)	(−3.87)
$\mathbb{I}(REL) * \mathbb{I}$(*Distress*)	−.0636*	−.0565	10.25***	10.38***	1.505*	1.674**
	(−1.71)	(−1.58)	(2.79)	(2.90)	(1.79)	(2.02)
Adj. R Sq.	.72	.725	.646	.655	.626	.629
Obs.	383,273	383,273	383,273	383,273	229,659	229,657
Net Effect $(\beta_R + \beta_{RD})$	.16***	.151***	−7.69**	−6.3*	−1.12	−.87
F-Stat	15.4	14.8	3.91	2.76	1.84	1.14
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$\textit{Loan Outcome}_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(\textit{Distress})_{f,t-1} + \beta_R \cdot \textit{REL MES}_{b,f,t} + \beta_{RD} \cdot \textit{REL MES}_{b,f,t} * \mathbb{I}(\textit{Distress})_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $\textit{Loan Outcome}_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(\textit{Distress})_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. In Panel A, *REL MES* is $\textit{Relationship ($ Amt)}_{b,f,t}$, in Panel B *REL MES* is given by $\mathbb{I}(REL)$. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 7. Robustness: Within-firm and within-bank analysis

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
Relationship	.4018***	.3936***	−31.78***	−31.65***	−5.563***	−5.51***
	(7.23)	(7.05)	(−6.62)	(−6.57)	(−3.52)	(−3.49)
Relationship ∗ 𝕀(*Distress*, 75)	−.2421***	−.252***	10.38	10.74	4.867*	5.073*
	(−3.13)	(−3.33)	(1.27)	(1.29)	(1.91)	(1.95)
Borrower × YearQtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
Lender × YearQtr FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.72	.721	.733	.735	.772	.774
Obs.	347,334	347,044	347,334	347,044	186,076	185,550
Net Effect $(\beta_R + \beta_{RD})$	.16**	.142*	−21.4***	−20.9***	−.696	−.437
F-Stat	4.47	3.69	7.57	6.95	.084	.032

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$\textit{Loan Outcome}_{b,f,t} = \alpha_{f,t} + \alpha_b/\alpha_{b,t} + \beta_R \cdot \textit{Relationship}_{b,f,t} + \beta_{RD} \cdot \textit{Relationship}_{b,f,t} * \mathbb{I}(\textit{Distress})_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $\textit{Loan Outcome}_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_{f,t}$ represents fixed effects for each borrower/year-quarter pair. The specification can include either lender fixed effects, α_b, or fixed effects for each lender/year-quarter pair, $\alpha_{b,t}$. $\mathbb{I}(\textit{Distress})_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $\textit{Relationship}_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 8. Robustness: Net effects of relationship lending using alternative definitions of distress

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
Definition of *Distress*	(1)	(2)	(3)	(4)	(5)	(6)
EDF (threshold at 70th percentile)	.131***	.118***	−13.5***	−11.5***	−1.28	−1.05
F-Stat	9.87	8.54	9.9	7.5	1.53	1.07
EDF (threshold at 80th percentile)	.136***	.12***	−12.3**	−10.1**	−1.47	−1.21
F-Stat	8.86	7.41	6.23	4.34	1.37	.954
EDF (threshold at 90th percentile)	.112**	.101*	−12.5**	−9.45	−1.77	−1.48
F-Stat	4.6	3.8	4.45	2.57	1.32	.946
Altman Z-Score ($\leq$ 1.8)	.203***	.192***	−15.1***	−13.8***	−2.65**	−2.54**
F-Stat	19.8	19.7	14.9	13	5.55	5.22
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*

This table reports the estimates of the coefficients from the following regressions over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. Each row reports the sum of the estimates for the coefficient β_R and β_{RD} obtained from using different definitions for $\mathbb{I}(Distress)_{f,t-1}$, described in the first column of the table. The first three rows define distress as described in Section 3.3.2, using three alternative thresholds: 70th, 80th, and 90th percentile. The fourth row define distress as a dummy variable that takes value 1 if the borrower's Altman Z-Score $\leq$ 1.8 and value 0 if it is $\geq$ 2.7, following the definition employed by Campello et al. (2018). $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 9. Robustness: Including loans with multiple lead arrangers

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0549	.0544	4.338	4.074	.7632	.6955
	(1.42)	(1.49)	(1.48)	(1.41)	(0.98)	(0.90)
Relationship	.2481***	.2184***	−24.36***	−23.18***	−2.983***	−2.924***
	(5.76)	(5.29)	(−7.99)	(−7.77)	(−3.63)	(−3.62)
$Relationship * \mathbb{I}(Distress, 75)$	−.0775	−.0743	11.58***	11.9***	1.354	1.448
	(−1.45)	(−1.46)	(2.67)	(2.78)	(1.28)	(1.38)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.624	.632	.642	.649	.643	.645
Obs.	482,253	482,253	482,253	482,253	274,418	274,418
Net Effect $(\beta\_R + \beta\_RD)$	.171***	.144**	−12.8***	−11.3**	−1.63	−1.48
F-Stat	7.74	6.2	6.67	5.33	1.69	1.42

This table reports the estimates of the coefficients from the following regression over the extended loan-quarter level sample, which includes also loan facilities with multiple lead arrangers:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 10. Robustness: Credit terms only in the presence of observable loan events (no pseudo credit register)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	−.0101	−.014	31.23***	28.04***	5.197***	5.065***
	(−0.28)	(−0.39)	(6.58)	(5.94)	(5.26)	(5.10)
Relationship	.1398***	.128***	−16.29***	−13.74***	−.8367*	−.7986*
	(4.82)	(4.65)	(−6.47)	(−5.65)	(−1.77)	(−1.67)
$Relationship * \mathbb{I}(Distress)$	−.0291	−.0289	−5.13	−.6726	−2.718**	−2.526**
	(−0.65)	(−0.65)	(−0.84)	(−0.11)	(−2.27)	(−2.11)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.746	.751	.655	.666	.623	.626
Obs.	31,619	31,616	31,619	31,616	18,961	18,961
Net Effect $(\beta_R + \beta_{RD})$	.111**	.099**	−21.4***	−14.4**	−3.55***	−3.33***
F-Stat	6.54	5.13	12.9	5.81	8.25	7.28

This table reports the estimates of the coefficients from the following regression over the sample of original loan observations, obtained from combining the main table of Dealscan and the loan modification table (*FACILITYAMENDMENT*):

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a new loan or loan modification between lender b and borrower f at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over the rolling 12-month window preceding the given loan observation. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the given loan observation. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for pred. increasing and pred. decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 11. Robustness: Stand-alone loan pricing terms

	Loan Spread		Commitment Fee		Annual Fee	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	2.424	2.152	.532	.3166	.181	.2004
	(0.84)	(0.77)	(0.85)	(0.51)	(1.03)	(1.15)
Relationship	-23.08^{***}	-21.4^{***}	-2.849^{***}	-2.774^{***}	$.6646^{***}$	$.6484^{***}$
	(−7.82)	(−7.48)	(−4.15)	(−4.08)	(3.08)	(2.97)
$Relationship * \mathbb{I}(Distress, 75)$	9.897^{**}	10.2^{**}	.8693	1.142	−.0711	−.1016
	(2.40)	(2.53)	(0.95)	(1.28)	(−0.29)	(−0.42)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.661	.67	.719	.723	.454	.457
Obs.	375,241	375,240	229,125	229,123	382,975	382,975
Net Effect $(\beta_R + \beta_{RD})$	-13.2^{***}	-11.2^{**}	-1.98^{*}	−1.63	$.593^{**}$	$.547^{**}$
F-Stat	7.73	5.76	3.54	2.49	5	4.16

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Loan Spread over Libor, Commitment Fee, or Annual Fee, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 12. The effect of relationship lending in distress: The role of borrowers' outside options I

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	Bond Market	No Bond Market	Bond Market	No Bond Market	Bond Market	No Bond Market
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0897**	.0441*	−.4157	6.192**	−.0848	.6599
	(2.16)	(1.69)	(−0.095)	(2.09)	(−0.078)	(0.96)
Relationship	.304***	.0954**	−25.16***	−13.53***	−3.834***	−1.645**
	(6.36)	(2.19)	(−6.37)	(−3.44)	(−4.07)	(−2.00)
$Relationship * \mathbb{I}(Distress, 75)$	−.1295**	−.0477	16.83***	2.298	2.651*	.6534
	(−2.33)	(−1.24)	(2.70)	(0.54)	(1.77)	(0.65)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adj. R Sq.	.633	.759	.644	.702	.645	.666
Obs.	206,678	176,550	206,678	176,550	129,663	99,943
Net Effect $(\beta_R + \beta_{RD})$	.175***	.048	−8.33	−11.2**	−1.18	−.991
F-Stat	6.87	1.04	1.52	3.99	.472	.651

This table reports the estimates of the coefficients from the following regression over the baseline loan-quarter level sample, split by borrowers that issued a public bond before a given loan and borrowers that did not:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table 13. The effect of relationship lending in distress: The role of borrowers' outside options II

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	Recent Bond	No Recent Bond	Recent Bond	No Recent Bond	Recent Bond	No Recent Bond
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0744	.0653**	−4.525	12.02***	−1.407	1.987***
	(1.54)	(2.54)	(−1.03)	(3.63)	(−1.20)	(2.93)
Relationship	.3435***	.1121***	−25.56***	−16.38***	−3.76***	−1.825***
	(6.30)	(3.05)	(−5.63)	(−4.77)	(−2.99)	(−2.62)
$Relationship * \mathbb{I}(Distress)$	−.1062*	−.0816**	19.71***	−.7155	4.684***	−.7075
	(−1.69)	(−2.29)	(3.08)	(−0.16)	(2.66)	(−0.76)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adj. R Sq.	.648	.756	.659	.685	.651	.662
Obs.	166,245	216,959	166,245	216,959	104,022	125,548
Net Effect $(\beta_R + \beta_{RD})$	.237***	.03	−5.85	−17.1***	.924	−2.53**
F-Stat	9.51	.519	.722	9.53	.211	5

This table reports the estimates of the coefficients from the following regression over the baseline loan-quarter level sample, split by borrowers that recently issues a public bond (in the 3 years preceding last loan event) and those that did not:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

B. Online Appendix: Analysis excluding crisis periods

Table B.1. Sample Characteristics: Loan-event sample (excluding crisis periods)

	Mean	S.D.	25^{th} pct	Median	75^{th} pct	Unique Obs.
Borrower Characteristics (Unique Borrowers: 3,076)						
Ln(Assets)	7.13	1.70	5.96	7.08	8.28	17,006
Book Leverage	0.33	0.20	0.20	0.31	0.43	17,006
Liquidity	0.07	0.09	0.01	0.03	0.09	17,006
Profitability	0.03	0.03	0.02	0.03	0.05	17,006
Cash Flows	0.49	0.60	0.20	0.33	0.55	17,006
Tangibility	0.35	0.25	0.14	0.28	0.54	17,006
Market-to-Book	1.65	0.82	1.14	1.41	1.87	17,006
$\mathbb{I}$(Credit Rating)	0.50	0.50	0.00	1.00	1.00	17,006
EDF	0.06	0.17	0.00	0.00	0.00	16,340
Years since IPO	20.18	16.48	6.58	15.17	31.75	17,006
$\mathbb{I}(PBOND)$	0.49	0.50	0.00	0.00	1.00	17,006
$\mathbb{I}(PBOND3Y)$	0.32	0.47	0.00	0.00	1.00	17,006
Loan Characteristics (Unique Loans: 19,422 – Modifications: 8,552)						
Relationship	0.64	0.38	0.33	0.75	1.00	27,974
Relationship ($ Amt)	0.68	0.39	0.36	0.89	1.00	27,974
$\mathbb{I}(REL)$	0.85	0.36	1.00	1.00	1.00	27,974
Loan Amount ($M)	360.73	530.62	55.52	175.00	400.00	27,974
All-In Drawn Spread	205.13	122.99	112.50	200.00	275.00	27,974
Maturity (Months)	46.35	21.94	31.00	50.00	60.00	27,366
All-In Undrawn Spread	31.66	21.26	15.00	25.00	50.00	17,033
$\mathbb{I}$(Collateral)	0.71	0.45	0.00	1.00	1.00	13,945
Upfront Fee	8.42	27.38	0.00	0.00	0.00	19,422
N. Lenders	8.85	8.53	3.00	7.00	12.00	19,422
$\mathbb{I}$(PP)	0.46	0.50	0.00	0.00	1.00	19,422
$\mathbb{I}$(PP - Pred. Decr.)	0.21	0.41	0.00	0.00	0.00	19,422
$\mathbb{I}$(PP - Pred. Incr.)	0.25	0.43	0.00	0.00	0.00	19,422
$\mathbb{I}$(Revolver)	0.69	0.46	0.00	1.00	1.00	19,422
$\mathbb{I}$(Term Loan)	0.28	0.45	0.00	0.00	1.00	19,422
$\mathbb{I}$(Corp. Purposes)	0.43	0.50	0.00	0.00	1.00	19,422
$\mathbb{I}$(Debt Repayment)	0.14	0.35	0.00	0.00	0.00	19,422
$\mathbb{I}$(Work. Capital)	0.15	0.36	0.00	0.00	0.00	19,422
$\mathbb{I}$(Takeover)	0.11	0.31	0.00	0.00	0.00	19,422
Lender Characteristics (Unique Lenders: 96)						
Ln(Bank Assets)	12.24	1.51	11.16	12.27	13.47	2,830
Bank Capital (Book, %)	7.38	2.65	5.38	7.61	9.12	2,830
Bank Capital (Mkt, %)	12.31	6.11	7.63	11.69	16.11	2,659

Table B.2. The effect of relationship lending on loan amount and pricing in distress (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0728**	.0735***	5.391*	4.952*	.7785	.6404
	(2.57)	(2.68)	(1.75)	(1.66)	(1.00)	(0.84)
Relationship	.2306***	.2149***	−20.9***	−19.54***	−2.726***	−2.685***
	(6.38)	(6.13)	(−6.88)	(−6.59)	(−3.52)	(−3.47)
$Relationship * \mathbb{I}(Distress)$	−.0871**	−.0847**	8.785**	9.2**	1.282	1.467
	(−2.30)	(−2.31)	(2.02)	(2.17)	(1.20)	(1.39)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.723	.727	.651	.659	.637	.64
Obs.	342,532	342,532	342,532	342,532	205,845	205,842
Net Effect $(\beta_R + \beta_{RD})$	.144***	.13***	−12.1**	−10.3**	−1.44	−1.22
F-Stat	10.6	9.37	6.16	4.7	1.49	1.09

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.3. The effect of relationship lending on other credit terms in distress (excluding crisis periods)

	𝕀(COLLATERAL)		UPFRONT FEE	
	(1)	(2)	(3)	(4)
$\mathbb{I}(Distress)$	.0129	.0115	−.6958	−.4145
	(0.83)	(0.75)	(−0.076)	(−0.046)
Relationship	−.0445***	−.0394***	−12.71**	−11.41**
	(−3.72)	(−3.21)	(−2.57)	(−2.25)
$Relationship * \mathbb{I}(Distress)$	.0157	.0236	22.18*	20.06
	(0.78)	(1.17)	(1.71)	(1.50)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.684	.69	.497	.518
Obs.	13,627	13,620	2,788	2,780
Net Effect $(\beta_R + \beta_{RD})$	−.029*	−.016	9.47	8.65
F-Stat	2.77	.802	.537	.426

This table reports the estimates of the coefficients from the following regression over the sample of loan observations from the Dealscan main table, not including the loan modifications:

$$\begin{aligned} Loan\ Outcome_{b,f,t} = \ & \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \\ & \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t} \end{aligned}$$

in which $Loan\ Outcome_{b,f,t}$ is either 𝕀(COLLATERAL) or UPFRONT FEE for a loan granted by lender b to borrower f at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over the rolling 12-month window preceding the given loan observation. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the given loan observation. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.4. Robustness: Alternative measures of relationship lending (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
Relationship ($ Amt)	.3328***	.3138***	−26.32***	−24.79***	−2.912***	−2.864***
	(8.63)	(8.45)	(−8.66)	(−8.41)	(−3.96)	(−3.90)
Relationship ($ Amt) $*$ $\mathbb{I}$(*Distress*)	−.124***	−.1186***	11.44***	11.53***	1.383	1.558
	(−3.10)	(−3.06)	(2.70)	(2.80)	(1.33)	(1.52)
Adj. R Sq.	.725	.729	.653	.661	.637	.64
Obs.	342,532	342,532	342,532	342,532	205,845	205,842
Net Effect $(\beta_R + \beta_{RD})$	.209***	.195***	−14.9***	−13.3***	−1.53	−1.31
F-Stat	22.2	20.9	10.6	8.8	1.74	1.3
Panel B						
$\mathbb{I}(REL)$	.2184***	.2031***	−17.39***	−16.37***	−2.695***	−2.627***
	(6.69)	(6.59)	(−6.39)	(−6.18)	(−3.81)	(−3.74)
$\mathbb{I}(REL) * \mathbb{I}$(*Distress*)	−.0418	−.0356	9.145**	9.328**	1.392	1.576*
	(−1.07)	(−0.95)	(2.28)	(2.39)	(1.50)	(1.71)
Adj. R Sq.	.723	.727	.65	.659	.637	.64
Obs.	342,532	342,532	342,532	342,532	205,845	205,842
Net Effect $(\beta_R + \beta_{RD})$	.177***	.167***	−8.25**	−7.05*	−1.3	−1.05
F-Stat	17.5	17.1	3.89	2.99	2.23	1.47
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$\textit{Loan Outcome}_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(\textit{Distress})_{f,t-1} + \beta_R \cdot \textit{REL MES}_{b,f,t} + \beta_{RD} \cdot \textit{REL MES}_{b,f,t} * \mathbb{I}(\textit{Distress})_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $\textit{Loan Outcome}_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(\textit{Distress})_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. In Panel A, *REL MES* is $\textit{Relationship ($ Amt)}_{b,f,t}$, in Panel B *REL MES* is given by $\mathbb{I}(REL)$. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.5. Robustness: Within-firm and within-bank analysis (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
Relationship	.3879***	.3835***	−31.08***	−30.97***	−5.876***	−5.829***
	(6.69)	(6.53)	(−6.17)	(−6.10)	(−3.61)	(−3.56)
Relationship ∗ 𝕀(*Distress*)	−.2077**	−.2236***	8.814	9.134	5.079*	5.271*
	(−2.54)	(−2.78)	(0.99)	(1.01)	(1.77)	(1.79)
Borrower × YearQtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
Lender × YearQtr FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.722	.722	.738	.74	.772	.774
Obs.	311,349	311,083	311,349	311,083	168,410	167,929
Net Effect $(\beta_R + \beta_{RD})$	.18**	.16**	−22.3***	−21.8***	−.798	−.558
F-Stat	4.92	4.1	7.28	6.76	.086	.041

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$\textit{Loan Outcome}_{b,f,t} = \alpha_{f,t} + \alpha_b/\alpha_{b,t} + \beta_R \cdot \textit{Relationship}_{b,f,t} + \beta_{RD} \cdot \textit{Relationship}_{b,f,t} * \mathbb{I}(\textit{Distress})_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $\textit{Loan Outcome}_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_{f,t}$ represents fixed effects for each borrower/year-quarter pair. The specification can include either lender fixed effects, α_b, or fixed effects for each lender/year-quarter pair, $\alpha_{b,t}$. $\mathbb{I}(\textit{Distress})_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $\textit{Relationship}_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.6. Robustness: Net effects of relationship lending using alternative definitions of distress (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
Definition of *Distress*	(1)	(2)	(3)	(4)	(5)	(6)
EDF (threshold at 70th percentile)	.14***	.128***	−13.4***	−11.7***	−1.53	−1.32
F-Stat	10.3	9.25	8.79	6.96	2.12	1.61
EDF (threshold at 80th percentile)	.149***	.134***	−12.9**	−10.9**	−1.77	−1.5
F-Stat	9.53	8.3	6.08	4.51	1.85	1.38
EDF (threshold at 90th percentile)	.122**	.111**	−14.9**	−11.9*	−2.06	−1.73
F-Stat	4.94	4.23	5.11	3.37	1.71	1.23
Altman Z-Score (≤ 1.8)	.217***	.206***	−15.3***	−14.3***	−2.8**	−2.7**
F-Stat	19.7	19.9	13.2	11.9	5.55	5.29
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*

This table reports the estimates of the coefficients from the following regressions over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. Each row reports the sum of the estimates for the coefficient β_R and β_{RD} obtained from using different definitions for $\mathbb{I}(Distress)_{f,t-1}$, described in the first column of the table. The first three rows define distress as described in Section 3.3.2, using three alternative thresholds: 70th, 80th, and 90th percentile. The fourth row define distress as a dummy variable that takes value 1 if the borrower's Altman Z-Score ≤ 1.8 and value 0 if it is ≥ 2.7, following the definition employed by Campello et al. (2018). $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.7. Robustness: Including loans with multiple lead arrangers (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0524	.0516	5.971*	5.708*	.8161	.7608
	(1.28)	(1.33)	(1.87)	(1.83)	(0.94)	(0.89)
Relationship	.2501***	.2218***	−23.83***	−22.89***	−2.978***	−2.923***
	(5.66)	(5.22)	(−7.55)	(−7.40)	(−3.52)	(−3.51)
$Relationship * \mathbb{I}(Distress)$	−.0721	−.069	10.84**	11.12**	1.243	1.325
	(−1.29)	(−1.27)	(2.36)	(2.46)	(1.09)	(1.17)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.627	.634	.647	.654	.649	.651
Obs.	433,116	433,116	433,116	433,116	246,482	246,481
Net Effect $(\beta_R + \beta_{RD})$	.178***	.153**	−13**	−11.8**	−1.73	−1.6
F-Stat	8.28	6.63	6.25	5.33	1.78	1.55

This table reports the estimates of the coefficients from the following regression over the extended loan-quarter level sample, which includes also loan facilities with multiple lead arrangers:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.8. Robustness: Credit terms only in the presence of observable loan events (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	−.0233	−.0228	32.77***	30.24***	5.326***	5.372***
	(−0.60)	(−0.59)	(6.56)	(6.14)	(4.96)	(4.99)
Relationship	.1428***	.135***	−15.04***	−12.39***	−.551	−.4656
	(4.87)	(4.79)	(−5.87)	(−4.93)	(−1.15)	(−0.95)
$Relationship * \mathbb{I}(Distress)$	−.0113	−.0134	−4.403	−.8878	−2.458*	−2.462*
	(−0.23)	(−0.28)	(−0.71)	(−0.14)	(−1.92)	(−1.92)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.742	.747	.67	.681	.622	.625
Obs.	27,974	27,970	27,974	27,970	16,636	16,635
Net Effect $(\beta_R + \beta_{RD})$	.131***	.122**	−19.4***	−13.3**	−3.01**	−2.93**
F-Stat	7.8	6.64	10.2	4.78	5.18	4.92

This table reports the estimates of the coefficients from the following regression over the sample of original loan observations, obtained from combining the main table of Dealscan and the loan modification table (*FACILITYAMENDMENT*):

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a new loan or loan modification between lender b and borrower f at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over the rolling 12-month window preceding the given loan observation. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the given loan observation. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for pred. increasing and pred. decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.9. Robustness: Stand-alone loan pricing terms (excluding crisis periods)

	Loan Spread		Commitment Fee		Annual Fee	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	3.665	3.275	.7732	.572	.1467	.1573
	(1.16)	(1.07)	(1.15)	(0.86)	(0.76)	(0.82)
Relationship	-22.63^{***}	-21.21^{***}	-2.944^{***}	-2.889^{***}	$.7197^{***}$	$.7134^{***}$
	(−7.43)	(−7.14)	(−4.03)	(−4.00)	(3.19)	(3.13)
$Relationship * \mathbb{I}(Distress)$	9.438^{**}	9.84^{**}	.602	.8587	−.026	−.0438
	(2.11)	(2.26)	(0.61)	(0.89)	(−0.098)	(−0.17)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Adj. R Sq.	.666	.675	.724	.728	.466	.469
Obs.	335,352	335,351	205,402	205,399	342,282	342,282
Net Effect $(\beta_R + \beta_{RD})$	-13.2^{***}	-11.4^{**}	-2.34^{**}	-2.03^{*}	$.694^{**}$	$.67^{**}$
F-Stat	6.86	5.31	4.41	3.43	6.19	5.67

This table reports the estimates of the coefficients from the following regression over the loan-quarter level sample, in which only loan facilities with a single lead arranger are included:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Loan Spread over Libor, Commitment Fee, or Annual Fee, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.10. The effect of relationship lending in distress: The role of borrowers' outside options I (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	Bond Market	No Bond Market	Bond Market	No Bond Market	Bond Market	No Bond Market
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0871**	.0371	−.3132	8.296***	−.0922	.8915
	(1.98)	(1.37)	(−0.065)	(2.64)	(−0.073)	(1.22)
Relationship	.3065***	.1007**	−24.15***	−13.77***	−3.841***	−1.652*
	(6.21)	(2.24)	(−5.96)	(−3.34)	(−3.95)	(−1.94)
$Relationship * \mathbb{I}(Distress)$	−.1122*	−.0478	17.58***	−.2547	2.701	.299
	(−1.93)	(−1.23)	(2.65)	(−0.056)	(1.59)	(0.29)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adj. R Sq.	.636	.762	.648	.706	.653	.677
Obs.	186,046	156,439	186,046	156,439	117,231	88,554
Net Effect $(\beta_R + \beta_{RD})$	.194***	.053	−6.57	−14**	−1.14	−1.35
F-Stat	7.69	1.29	.867	5.47	.37	1.2

This table reports the estimates of the coefficients from the following regression over the baseline loan-quarter level sample, split by borrowers that issued a public bond before a given loan and borrowers that did not:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.

Table B.11. The effect of relationship lending in distress: The role of borrowers' outside options II (excluding crisis periods)

	Log(Loan Amount)		All-In Drawn Spread		All-In Undrawn Spread	
	Recent Bond	No Recent Bond	Recent Bond	No Recent Bond	Recent Bond	No Recent Bond
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}(Distress)$	.0783	.0582**	−4.815	14.64***	−1.642	2.375***
	(1.49)	(2.22)	(−0.99)	(4.15)	(−1.17)	(3.23)
Relationship	.355***	.112***	−26.35***	−15.92***	−4.126***	−1.851**
	(6.25)	(2.98)	(−5.62)	(−4.40)	(−3.06)	(−2.54)
$Relationship * \mathbb{I}(Distress)$	−.1022	−.0766**	21.04***	−2.988	4.719**	−1.079
	(−1.50)	(−2.14)	(3.08)	(−0.61)	(2.40)	(−1.09)
Borrower FE & Year-Qtr FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Lender FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Adj. R Sq.	.649	.759	.664	.689	.661	.673
Obs.	149,128	193,333	149,128	193,333	94,097	111,656
Net Effect $(\beta_R + \beta_{RD})$	.253***	.035	−5.31	−18.9***	.593	−2.93**
F-Stat	9.36	.711	.555	10.5	.077	6.25

This table reports the estimates of the coefficients from the following regression over the baseline loan-quarter level sample, split by borrowers that recently issues a public bond (in the 3 years preceding last loan event) and those that did not:

$$Loan\ Outcome_{b,f,t} = \alpha_f + \alpha_b + \alpha_t + \beta_D \cdot \mathbb{I}(Distress)_{f,t-1} + \beta_R \cdot Relationship_{b,f,t} + \beta_{RD} \cdot Relationship_{b,f,t} * \mathbb{I}(Distress)_{f,t-1} + \gamma \cdot X_{b,f,t-1} + \varepsilon_{b,f,t}$$

in which $Loan\ Outcome_{b,f,t}$ is either Log(Loan Amount), All-In Drawn Spread, or All-In Undrawn Spread, for a loan granted by lender b to borrower f currently outstanding at time t. $\alpha_f, \alpha_b, \alpha_t$ represent, respectively, borrower, lender, and year-quarter fixed effects. $\mathbb{I}(Distress)_{f,t-1}$ is a dummy equal to 1 if the borrower's EDF is greater than the 75th percentile of the distribution of EDFs for six or more months over $[t-4, t-1]$. $Relationship_{b,f,t}$ is the fraction of loan events between lender b and borrower f over the total loan events of firm f occurred in the 5 years preceding the most recent loan event. $X_{b,f,t-1}$ is a vector of borrower, loan, and lender controls. Borrower controls include: credit rating dummies, size, book leverage, profitability, years since IPO, tangibility, liquidity, cash flows, market-to-book, dummy for issuance of any bond. Loan controls include dummies for loan types and loan purpose, the number of syndicate participants, and dummies for predominantly increasing and predominantly decreasing performance pricing grids. Lender controls include size and book equity. These controls are always included in the specifications. In parentheses t statistics are reported, obtained from clustering standard errors at the borrower level. ***, **, * indicate statistical significance at the 1%, 5% and 10%, respectively.