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Finance Working Paper N° 794/2021
October 2023

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ECGI Working Paper Series in Finance

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Abstract

With a hand-collected set of 545 debtor-in-possession (DIP) loan facilities, 2002-2019, we show that these short-term loans are highly over-collateralized and contain a comprehensive set of restrictive covenants, mandatory prepayments, and restructuring milestones - all of which help produce a near-zero repayment risk. Nevertheless, the all-in spread drawn averages 658 basis points - almost five times the average spread on matched investment-grade loans, and nearly double the average spread on matched leveraged loans issued by highly risky firms outside of bankruptcy. Textual analysis of court documents shows lack of outside lender participation in the loan solicitation process but spreads are somewhat lower when outside interest is high. We discuss alternative interpretations of the high DIP-loan spreads, ranging from monitoring-cost compensation to rent extraction as DIP-loan providers with strong bargaining power share in the preservation of going-concern value helped by the `last resort' loan.

Keywords: debtor-in-possession financing, Chapter 11; loan spreads, loan fees, default risk, leveraged loans, relationship lending, rent extraction

JEL Classifications: G14, G34

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Loans to Chapter 11 firms: Contract design, repayment risk, and pricing*

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December 28, 2022

Journal of Law and Economics, forthcoming

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"The question the debtor had to ask, is: Is this DIP better than a liquidation?"
—Mark Ellenberg (Lyondell's lead counsel) to the US Bankruptcy Judge, explaining Lyondell Chemical Company's motion to approve a $8 billion DIP loan (February 27, 2009).

"In the Great Recession default cycle, no DIPs defaulted"
—David Keisman, Senior Vice President, Moody's Investors Service (*Reuters*, April 2016).

1 Introduction

A firm seeking bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code must be able to fund the process plus costs of continued operations. For this purpose, the debtor generally looks to internal cash and "debtor in possession" (DIP) financing as sources of operating capital. A substantial academic literature recognizes that DIP financing is central to the preservation of going-concern value of Chapter 11 firms, and that DIP-lenders play an important governance role (Hotchkiss et al., 2008; Ayotte and Morrison, 2009; Ayotte et al., 2013). However, little is known as to how these loans are precisely structured to minimize repayment risk and, ultimately, priced in terms of loan fees and spreads. To fill this gap, we document and perform a descriptive analysis of (1) the nature of the control rights granted to DIP-loan providers through contracting, (2) the resulting loan-repayment rate (our measure of repayment risk), and (3) the loan-solicitation process used to induce competition among potential DIP-loan suppliers.

At first blush, loans to Chapter 11 firms may seem highly risky to lenders. However, we show that *all* of the 545 DIP-loan facilities raised by the 359 large Chapter 11 firms in our sample (2002–2019) received full repayment of both principal and interest. Moreover, our evidence on repayments extends Moody's (2008), which documents only a single DIP loan with less than full repayment for the period back to the start of DIP financing in 1988 (Dahiya, John, Puri, and Ramirez, 2003). This descriptive evidence strongly suggests that, conditional on obtaining a DIP loan, the repayment risk is no worse than investment-grade loans, which we therefore use as one of our loan-pricing benchmarks.

Our hand-collected data suggests that the DIP-loan contract design coupled with a substantial degree of over-collateralization (the face value averages only 15% of the debtor's book assets) effectively insulates loan repayment from the debtor's underlying asset risk. The DIP-loan contract, which has short maturity (on average ten months versus four years for loans outside of bankruptcy) and super-priority status, includes a large number of financial covenants, prepayment requirements, and milestones that are tied

to liquidity, performance, capital expenditures, production, asset sales, restructuring outcomes, and even corporate governance. Also important, stringent disclosure requirements allow DIP-loan providers to react quickly if and when their borrowers' asset quality starts to deteriorate to the point of triggering covenant violations.

Because DIP loans appear to be no riskier than investment-grade loans outside of bankruptcy, we use year, industry, and firm-size matched investment-grade loans as a benchmarks for our DIP-loan pricing analysis. Moreover, we also compare the DIP-loan spreads to matched leveraged loans. While these loans are all outside of bankruptcy, for our purpose their credit spreads present interesting benchmarks because their risk-classifications are also based on historical records of loan repayments. Surprisingly, while we expect loan spreads to increase with repayment risk, our evidence tells a different story: DIP-loan all-in spread drawn (AISD) in our sample averages 658 basis points (bps) over the London Interbank Offered Rate (LIBOR). This spread is almost *five times* the average spread on matched investment-grade loans, and almost double the average spread on matched leveraged loans issued by highly risky (non-bankrupt) firms. We also find that DIP-loan spreads are high even in comparison with spreads on high-risk distressed loans issued by the same bankrupt firms within three years—and even one year—of their Chapter 11 filings.

Direct costs of originating, monitoring, and possibly renegotiating DIP loans are unobservable to the econometrician. However, as we document, these costs generate various forms of upfront and periodic fees. Consistent with the notion that DIP-loan providers incur relatively high costs, we find that DIP-loan fees are substantially higher than fees observed both for matched investment-grade and leveraged loans. More specifically, upfront and annual fees are on average nearly three times higher than those associated with leveraged loans and six times those for investment-grade loans. Also, in addition to fees, some debtors offer cost-sharing arrangement where DIP-loan providers are reimbursed for regular out-of-pocket expenses throughout the restructuring process. Overall, this fee evidence is important because it suggests that DIP-loan providers are amply reimbursed for expenses.

The most interesting—and challenging—question raised by our evidence is why DIP-loan spreads are so much higher than what is expected based on our measure of repayment risk. One possibility is that the self-selection by skilled loan providers leads the observed rate of repayment to underestimate the ex ante loan risk. Of course, since this risk is also controlled by the high degree of over-collateralization and the heavy use of debt covenants documented here—two instruments that are readily available to any potential

loan provider—it is unclear to what extent self-selection can explain the high spreads. Moreover, our evidence that DIP-loan spreads are much higher than even matched leveraged loans by the same firm, which are also affected by lender self-selection, may go a long way in controlling for latent risk factors.

A second possible interpretation is that the high risk-adjusted spreads represent an additional form of compensation for the DIP-loan provider's expected monitoring costs. However, this raises the question of why the contracting parties would find it necessary to also use the spread to cover expected monitoring costs. As we show, DIP loans already use a large number of regular fee-types for this purpose, ranging from upfront fees to periodic fees and fees that are contingent on events like loan extension, exit and default. Also, there is little support in the extant banking literature for the notion that the costs of loan origination and monitoring, which are naturally covered by loan fees, should also be covered by spreads. Rather, the extant literature consistently treats competitive loan spreads as a compensation for credit risk only. This is particularly true for studies of credit lines (Thakor and Udell, 1987; Boot, Thakor, and Udell, 1987), which are present in as much as 83% of the DIP-loan packages in our sample.

The most plausible interpretation is that the high risk-adjusted DIP-loan spreads represent a form of rent extraction by lenders with strong bargaining power. Specifically, we show that prepetition secured lenders, who exert substantial control over the DIP-loan arrangement process, supply close to eighty percent of the DIP loans in our sample. Secured lenders may refuse new lenders to prime their liens on collateral, and we show that prepetition secured lenders are more likely to be DIP-loan providers when they hold large claims against the debtor. With large claims, the debtor most likely has exhausted its unencumbered assets to pledge as collateral for securing new DIP loans, which is when prepetition secured lenders are in a blocking position against outside lenders. Since a DIP loan in many cases is needed to prevent a more costly liquidation outcome, this form of rent extraction is tantamount to the lender extracting a share of the debtor's efficient preservation of going concern value.

To further address our rent extraction hypothesis, we examine possible variation in loan spreads associated with the loan solicitation process and lender type. We use textual analysis of court documents to quantify the debtor's effort in creating competition among potential lenders. The results further support rent extraction: While approximately seventy percent of the debtors indicate that they have approached prospective lenders, these debtors receive interest from more than one lending group in only a third of the cases—typically prepetition lenders. Moreover, in only a tenth of the cases do interested lenders proceed to a formal round of bidding, and there is little evidence that approaching prospective

outside lenders are associated with lower spreads. Also interesting, we find no empirical support for the hypothesis that expected ex post rents from providing DIP loans are competed away through low loan rates ex ante as lenders compete to provide loans to the firm outside of bankruptcy. If this were the case, we should find higher DIP-loan spreads among prepetition secured lenders than among new lenders, which we do not. We do, however, find that spreads are 152 bps lower when the number of interested lenders is above the sample median of three, which suggests that a more intensive search and bidding process may help to lower DIP-loan spreads in some cases.

Finally, the banking literature on monopolistic lending argues that prior relationship lending can produce an informational advantage over new lenders. We pursue this argument in our DIP-loan context by examining potential effects of lender type on loan spreads. We show that over half of the DIP-loan facilities are provided by prepetition secured lenders who also have a strong prior lending relationship with the borrower. However, spread-differences between DIP loans provided by relationship prepetition lenders and those by non-relationship lenders are generally small and statistically insignificant. This evidence further supports our rent extraction (value sharing) hypothesis.

Our paper contributes to the literature on the financing of bankrupt firms on three fronts. First, our hand-collected data set allows us to document in unprecedented detail the exceptionally tight lender protections embedded in DIP-loan contracts and to compare them with those of matched loans outside of bankruptcy. This comparison shows how the loan-contract design enables lenders to insulate DIP loans' default risk from debtors' underlying asset risk. Our evidence on this decoupling is new and unique in the loan contracting literature (Roberts and Sufi, 2009). Second, our large-sample evidence on DIP-loan repayment risk, which takes advantage of both financial and legal sources, is also a first in the bankruptcy literature. Third, relative to the extant studies on DIP-loan spreads (e.g., Hasan, Ramirez, and Zhang, 2019; Tung, 2020), our use of court documents allows us to better understand the competitiveness of the loan-bidding process. Also important, we present new evidence on lender type and relationship lending. This granular evidence helps explain how frictions in the DIP-loan solicitation process may contribute to high spreads.

2 The process of obtaining a DIP loan

2.1 DIP-loan motion and court approval

Under the U.S. Bankruptcy Code, a debtor must be able to fund both the bankruptcy process and the cost of business operations to continue as a going-concern. When internal sources of cash are insufficient and a debtor is unable to obtain unsecured credit in the ordinary course of business, §364 of the Bankruptcy Code permits the debtor to arrange a DIP loan with super-priority status after notice and a court hearing.

A Chapter 11 firm must file a motion to the court for DIP-loan approval, which is typically filed simultaneously with the bankruptcy filing itself. This motion (1) provides key information on type, amount, lead lenders, and important contractual requirements of a DIP loan; (2) describes a debtor's liquidity position and its need for DIP financing; (3) provides detailed background information on a debtor's business operations and prepetition capital structure, helping it to justify the need for DIP financing and identify prospective lenders; and (4) specifies a prenegotiated plan or a restructuring support agreement (RSA), if there is one.

Access to DIP financing must be approved by the judge through an interim order that is often immediately issued after a motion is filed (typically, within a few days after a Chapter 11 filing). This interim authorization is followed by public hearings in which key stakeholders are given the opportunity to file objections to proposed terms of the DIP loan. The debtor is required to demonstrate to the judge that it has searched, solicited, or surveyed interests of potential lenders and that the proposed loan package is considered the best option available. Debtors routinely argue that the terms are indeed competitive or "fair, reasonable and adequate" (quoted from Buffets Holdings' motion filed on 1/22/2008).[1] After public hearings, the judge issues a final order approving the DIP loan or denies it altogether.[2]

2.2 The central role of prepetition secured lenders

Under §364(d), a DIP loan may be secured by a "priming lien"—that is, by a senior or equal lien on property that is already subject to an existing lien by prepetition lenders. Although allowing priming

[1] Online Appendix Table OA1 presents four examples of debtors' motions justifying DIP financing, including this quote.

[2] It is rare for judges to issue an order rejecting a DIP loan. In our sample, we find only three such cases. The Chapter 11 filing by Mississippi Chemical Corp. on May 16, 2003, is one such example. The judge initially issued an interim order approving DIP financing. After several public hearings, the judge issued a final order denying the financing on August 28, 2003. In two other cases, IT Group and BMC Industries, there was no interim order or final order issued after motions were filed. Even though news articles suggest that these two companies may have obtained DIP financing, we treat them as "Not Approved" as no final order can be located.

prepetition lien encourages bids by new lenders, in practice, it is difficult, if not impossible, for them to prime prepetition secured lenders' security interest without the latter's consent (Bellucci and McCluskey, 2017). This is because prepetition lenders' security interest and rights to repossess collateral are governed by their credit agreements. Consent from secured lenders is required to modify or release collateral. By refusing consent to having their collateral primed, prepetition secured lenders are in a blocking position to prevent new lenders from providing secured DIP loans at more competitive terms.

The position of prepetition lenders is further strengthened by their informational advantage relative to new lenders (Ayotte and Skeel, 2006; Schenone, 2010; Bharath et al., 2011; Hasan et al., 2019), and by the opportunity to roll up part of their existing loans into a DIP loan such that their existing claim acquires the same super-priority status as the DIP loan. In addition, prepetition secured lenders often package DIP loans with a RSA, which is critical to ensuring an expedited and smooth reorganization in bankruptcy.

The prospect of competition from potential outside DIP-loan providers is enhanced by the fact that the complex DIP-loan contract design is available to any potential lender. Because the restrictive contract terms themselves help insulate DIP-loan repayment risk from the debtor's underlying asset risk, outside loan providers may be willing to compete with a prepetition lender even when the latter has more precise knowledge of the debtor's asset risk. The prepetition lender may, however, ultimately win this competition by matching the terms offered by outside lenders but with a less restrictive DIP-loan contract, which according to the prepetition lender's private information has the same risk as the contract offered by outsiders.

Moreover, debtors trying to run a competitive process for arranging a DIP loan under time pressure would likely have to be careful of the type and number of potential lenders to approach. Notwithstanding nondisclosure agreements, words about a potential bankruptcy filing travel fast and may create major public-relations risks with customers and suppliers and put downward pressure on security prices. Interestingly, in their motions for DIP financing, Chapter 11 firms instead routinely tell the court that the process of obtaining DIP loans was sufficient to obtain terms that are "fair, reasonable and adequate" and permitted debtors to "run a competitive sale process designed to maximize value for their creditors" (see Table OA1 for these two quotes from the motions of Buffets Holdings and School Specialty, respectively).

3 Data and sample description

3.1 Data sources and sample formation

We obtain all Chapter 11 filings by large U.S. public firms (with assets above $100 million in constant 1980 dollars) over the period 2002–2019 from the UCLA–LoPucki Bankruptcy Research Database. We start our sample in 2002 as U.S. bankruptcy courts in all 94 districts started to maintain electronic case dockets on PACER in that year.[3] Our sample ends just before the COVID-19 pandemic because loans issued during this period are not comparable to earlier periods due to unprecedented government interventions. We collect key characteristics of each case and retrieve reorganization or liquidation plans and disclosure statements confirmed by the bankruptcy court from Bankruptcydata.com and PACER. The status of each case, such as reorganization or liquidation, is cross-checked and verified using all abovementioned sources. This initial sampling results in a total of 592 Chapter 11 cases.

To identify whether a Chapter 11 firm obtains a DIP loan, we manually search key phrases including "debtor-in-possession financing," "DIP financing," "post-petition financing," and "secured financing" in the electronic court docket through PACER. We focus on the first/initial DIP-financing package that is typically obtained by the debtor at the time of a Chapter 11 filing, not subsequently amended packages or packages offered later in the bankruptcy process by different DIP lenders.[4] This is because the first/initial package should reflect the asset risk of the debtor at the time of the Chapter 11 filing and is typically negotiated under time pressure, and information on loan terms is more complete.

We note that 373 of the 592 Chapter 11 cases received a final order for DIP financing from the judge. For each DIP loan, we download motion, interim order, objections to motion (if any), final order, and master credit agreement and fee letters (whenever available).[5] We manually process close to 2,000 court documents (with multiple rounds of cross-checks) to determine not only the pricing terms but also non-pricing terms such as lender protection clauses and restructuring milestones, lender type, loan bidding process, and objections raised. Due to data availability, we obtain such information for 359

[3]Note that, when we started building our initial sample back in 2014 (containing DIP-loans from 2002–2013), the dockets for most courts in 2002 and 2003 were electronically available. Due to later changes made by PACER, however, court dockets during those first two years in our sample period are no longer available electronically.

[4]Junior DIP loans, funded by either secured or unsecured debt holders and ranked lower in priority than the initial DIP-loan packages, are sometimes provided later in the Chapter 11 restructuring process and typically used as part of the loan-to-own strategy.

[5]The debtor and lenders can request the fee letter for DIP loans to be filed under seal, which is the case for 26 of our total sample of DIP loans. In the analysis to follow, we treat DIP-loan fees as missing in these 26 cases. It is worth noting that the average loan spread for cases with and without fee information is almost identical.

of these 373 cases. There are a total of 545 loan facilities within the 362 loan packages obtained by these 359 firms, as three of them have two packages each. Our rigorous sample formation process results in the most comprehensive data set on DIP-loan facilities in the literature to date. In particular, our sample of 545 DIP-loan facilities over the period 2002–2019 is 50% larger than the sample of 348 facilities over the period 1988–2012 used by Hasan, Ramirez, and Zhang (2019). Also, they base their loan-rate information on Dealscan which, for the overlapping period 2002–2012, report pricing information for only 169 facilities out of our sample of 359 facilities. Furthermore, as we show in Section 5 below, spreads from our hand-collected sample often differ from those reported by Dealscan.

In Figure 1, the bars show the annual distribution of our sample of 578 firms filing for Chapter 11 over the period 2002–2019. Of the total sample, 359 firms (62%) obtained DIP loans, distributed annually as shown by the line in the figure. The average of 62% with DIP financing ranges from a low of 50% in 2002 to a high of 89% in 2018 and is substantially higher than the average fraction of 30% with DIP financing reported by Dahiya, John, Puri, and Ramirez (2003) for the period 1988–1997. Figure 2 breaks down the sample of firms with and without DIP financing according to each firm's Fama-French (FF) 12-industry. The three industries with the highest shares of DIP financing are manufacturing (88%), wholesale and retail (86%), and consumer nondurables (78%), while the three industries with the lowest shares of DIP financing are finance (29%), telecommunication (35%), and business equipment (49%). This industry pattern suggests that industries with large working capital needs and access to relatively tangible assets to be used as collateral are particularly prone to obtain DIP loans.

3.2 Pre-filing firm characteristics and Chapter 11 outcomes

We retrieve firm financial information from Compustat, as of the last fiscal year before a sample firm's Chapter 11 filing. Detailed information on sample firms' debt structure—such as the amount of bank loans outstanding at the time of bankruptcy filing—is extracted from Capital IQ and firms' Securities and Exchange Commission (SEC) filings from Edgar. From these data sources, we construct firm- and case-level control variables. As defined in Table A.1, these include Size (the natural logarithm of book assets); Leverage (the ratio of total liabilities to book assets) and ROA (the ratio of EBITDA to book assets), both of which measure the degree of financial distress; Cash (the ratio of cash and marketable securities to book assets), which measures short-term liquidity; Tangibility (the ratio of PP&E to book assets), which measures the tangibility of assets; Bank-loan/assets (the ratio of amount of outstanding

bank loans at the time of bankruptcy filing to book assets), which measures the level of collateralization of bank loans; and Industry distress (an indicator variable for whether the median sales growth of the two-digit SIC industry is below -5%), which accounts for potential industry-level distress.

Table 1 compares firm and Chapter 11 case characteristics for the 359 firms with DIP financing and the 219 firms without. While untabulated, the differences shown in Table 1 are confirmed based on a standard probit analysis, and are consistent with results reported by Li and Wang (2016). First, the size of book assets of the two sets of firms are comparable across firms with and without DIP loans. Both the mean and median leverage ratios of firms with DIP financing are close to one, comparable to those of firms without. We also find that notwithstanding higher ROA, firms with DIP financing are more cash constrained but have a greater borrowing base for secured financing with more tangible assets than do firms without. Finally, the median firm with DIP loans has a slightly higher bank loans-to-assets ratio.

Panel B of Table 1 shows that about 70% of the cases with DIP financing are filed in the Delaware court or the court of the Southern District of New York (NYSD). About one-third of the cases are either prepackaged or prenegotiated Chapter 11 filings. These statistics are comparable to those for cases without DIP financing. In two-thirds of the cases, firms with DIP financing successfully reorganize and emerge from Chapter 11 as going-concerns while liquidation (including conversions to Chapter 7) occurs in about one-fifth of the cases. The combination of higher emergence and lower liquidation rates of firms with DIP financing than firms without DIP financing partly reflects both the greater going-concern values of these firms and the role of DIP loans in relaxing their financial constraints. Finally, our sample of firms with DIP financing on average spend 12 months (median 9 months) in Chapter 11 (excluding the 20 cases that are dismissed or remain unresolved), comparable to those without DIP financing.

4 Contract design and repayment risk

In this section, we first describe DIP-loan contractual terms in unprecedented detail. Second, we document the frequency of less-than-full loan repayments (face value plus interest)—the repayment risk. Third, we provide a perspective on the uniqueness of the DIP-loan contract design by comparing contract terms across DIP loans and loans issued by firms outside of bankruptcy.

4.1 DIP-loan contract terms

Table 2 describes DIP-loan terms at the loan-package level (a loan package may contain one or more loan facilities). The mean (median) package is $366 million ($95 million), which corresponds to 15% (16%) of a debtor's book assets (liabilities). In 83% of the packages, there is a revolver, which often contains a letter of credit facility. Term loans are present in 48% of the packages and 41% contain multiple facilities (while not tabulated, there are increasingly more term loans in DIP-loan packages over time, which coincides with the rise of term loans in the leveraged-loan market in general (Berlin, Nini, and Yu, 2020)). DIP-loan maturity averages 10 months (median 8 months), and in 71% of the cases, loan maturity is explicitly tied to plan confirmation or §363 asset sale. The combination of DIP loans being a small share of debtors' total liabilities and a relatively short maturity lowers DIP lenders' risk exposure.

All DIP loans have super-priority status, almost all have a first or second lien on a debtor's assets, and 82% have a priming lien. Note that the frequency of a priming lien in our sample is much higher than that reported for earlier sample periods (Skeel, 2004). We find that about 28% of the loans include a roll-up provision, which allows lenders to convert all or a portion of their prepetition debt into the DIP loan and to accrue interest at the DIP-loan rate. For the 86 cases with the roll-up amount available, the average amount of the roll-up represents 50% of the DIP-loan amount. The evidence shows that lenders typically pair the roll-up facility with the new money facility on a one-to-one basis in a package.

Furthermore, while in 98% of the cases the stated purpose of the DIP loan is to finance working capital, in as many as 60% of the cases the DIP-loan proceeds are also used to pay prepetition debt expenses (both interest and principal). The combination of a roll-up and paying prepetition debt expenses out of DIP-loan proceeds allows DIP lenders who hold prepetition debt to reduce the risk exposure of their loan holdings. Perhaps not surprisingly, in untabulated analysis, we find that 83% of the DIP loans in our sample are provided by existing creditors and shareholders, and 79% are by prepetition secured lenders.

DIP loans make extensive use of covenants. Table 2 shows that almost all (99%) of the loans include affirmative or negative covenants, 87% have financial covenants, and 60% and 55% have liquidity-/cash-level and EBITDA-level covenants, respectively. The extensive covenant provisions in DIP loans are in stark contrast to the covenant-lite feature of leveraged loans (Becker and Ivashina, 2016; Billett et al., 2016). In more than one-tenth of the packages, covenants are tied to management or governance changes. With these covenants in place, lenders can call default if a newly-hired turnaround CEO leaves the post,

for example. Prepayment requirements, such as asset sale sweep that requires a debtor that sell assets in bankruptcy to use the proceeds to pay back the loan, are imposed in half of the packages.

DIP loans also impose a long list of milestones and events of default. The five most common provisions are Chapter 7 conversion or case dismissed (94% of our sample), appointment of trustee or examiner (84%), loss of automatic stay or exclusivity (74%), change of control (71%), and plan and disclosure statement filing and approval (66%). These requirements help control DIP lenders' exposure to risk associated with the expected change in the course of reorganization and a debtor's loss of control of its business. Moreover, about one-fifth of the loans require the debtor to set up a bidding procedure for selling assets through §363 of the Bankruptcy Code, and about another one-fifth of the loans require the debtor to hire specific key personnel such as a chief restructuring officer. These provisions grant DIP lenders strong protection and influence in the business operations of the debtor (Ayotte and Elias, 2020).

In summary, DIP loans (1) represent a relatively small share of the overall liabilities of the debtor, (2) have short maturity, (3) are fully secured, (4) enjoy super-priority with multiple restrictive covenants, and (5) include mandatory prepayment clauses and milestones. In other words, DIP lenders enjoy extraordinarily strong protections of their super-priority debt claims. In our analysis below, we investigate whether these protections result in low payment default rates to lenders.

4.2 DIP-loan repayment risk

In our terminology, we equate repayment risk with the frequency with which DIP-loan providers receive less than 100% recovery of principal and accrued interest. To estimate this risk, we draw information from three data sources. The first and most important data source is our sample of 545 facilities over the period 2002–2019. We manually check bankruptcy plans and disclosure statements to determine whether there is any mention of 'default' or 'impairment' of claims. We note that DIP loans require settlement in cash and are therefore formally regarded as impaired in the reorganization plan if the payment is in some other form, e.g., new debt or equity of the emerged firm, and/or the payment is made late. However, while formally regarded as impaired, DIP lenders who exercise the loan-to-own strategy may well prefer a settlement in stock even if the alternative of a cash settlement would also yield a 100% recovery. In our sample, seven DIP-loan packages have their claims treated as impaired by the reorganization/liquidation plan due to payment not in original form, or late payment.

As shown in Table OA2, in these seven cases, DIP lenders recover 100% of their principal and accrued

interest in the form of a combination of cash and newly issued equity, resulting in full recovery using trading prices of equity on the first day after reorganization. We therefore classify these loans as fully repaid. Furthermore, we account for the fact that a technical default, which occurs when there is a violation of a protective covenant or that a milestone is not reached, is not the same as a repayment default. This is because, under the loan contract, technical defaults permit the lender to either accelerate full loan repayment or renegotiate loans terms. For example, 94% of the DIP loans in our sample treat a conversion to Chapter 7 or a case dismissal as events of technical default. Hence, a technical default does not necessarily lead to a loss for the lender, and our evidence below shows that it almost never does.

Our second data source is Moody's (2008), which compiles all DIP loan defaults over the period 1988–2008. This report identifies only two defaults among the 297 cases examined: Marvel Entertainment (Chapter 11 petition filed on December 27, 1996) and Winstar Communication (filed on April 18, 2001). Even among these two reported defaults, Marvel's DIP loan in fact recovered 100%, leaving Winstar's DIP loan as the *only* DIP-loan without full recovery between 1988 and 2008. More specifically, Winstar's loss amounted to about 75% on the $300 million DIP loan. Winstar's bankruptcy was attributed to a failure of Lucent Technologies to honor a contract in the midst of the 2000 'dot-com bust'. Also surprising, as noted by David Kreisman, Senior Vice President, Moody's Investors Service, in the quote at the beginning of this paper: during the recent financial crisis, not a single DIP-loan defaulted, a fact that extends to the population of DIP loans. This observation stands in sharp contrast to the leveraged-loan default rate, which according to PIMCO was about 20% during the financial crisis (*Financial Times*, July 5, 2019.). PIMCO also assesses the default rate of leveraged loans after the 2000 "dot-com bust" at 25%.

Third, to estimate repayment risk, we also employ the number of DIP loans issued all the way back to 1988—when these loans first came into existence. According to Bankruptcydata.com and our manual data collection using court dockets through PACER, at least 800 U.S. public firms that filed for Chapter 11 over the period 1988–2010 received DIP financing. This is more than twice the number of cases reported in Moody's (2008) for a similar period. Moreover, we identify another 400 U.S. public firms that obtained DIP financing between 2011 and 2019. Since only *one* of these 1,200 DIP loans resulted in less than 100% recovery of both principal and interest, we estimate the DIP-loan repayment risk to be 0.08% (1/1200).

To place our repayment-risk estimate of 0.08% in a broader perspective, we apply the major rating agencies' own systems for mapping loan-default rates into rating scores. Our estimate of a DIP-loan

repayment risk of 0.08% implies a loan rating of Baa1 by Moody's (Exhibit 31 in Moody's (2018)) or BBB+ or better by S&P (Table 9 in S&P (2019)). In fact, during the 1990s, when DIP loans started to gain prominence, Fitch Investors Services rated these loans as investment grade (primarily A ratings) (Chatterjee, Dhillon, and Ramírez, 2004). In sum, the repayment risk of DIP loans is no higher than for investment-grade loans outside of bankruptcy. This finding suggests that the extraordinary DIP-loan contract design helps lenders to separate repayment from the borrower's underlying asset risk. Combining this contract design with DIP-loan providers' superior monitoring skills lowers repayment risk to a level consistent with investment-grade credit.

4.3 Contract terms of matched loans outside of bankruptcy

In this section, we perform matched loan analysis to compare contract terms of DIP loans with those of investment-grade loans that share a similar (very low) payment default risk profile, leveraged loans that are used to finance highly risky companies (similar to bankrupt companies), and loans issued by the same Chapter 11 firms within a few years before their bankruptcy filings. Comparing DIP-loan terms with relevant benchmarks highlights the unique level of lender protections provided by DIP-loan contracts.

We first implement a contemporaneous loan-matching procedure by identifying an investment-grade loan issuer and a (non-bankrupt) leveraged-loan issuer in the year of Chapter 11 filing that matches a Chapter 11 firm on Fama-French-12 (FF12) industry and being closest in book assets. Specifically, a loan in Dealscan is classified as a leveraged loan if "MarketSegment" specifies it as "Leveraged," "High Leveraged," or "LBO". Loan facilities of these three categories account for close to 30% of total facilities in Dealscan. For simplicity, treat as investment-grade loans those that are not classified as leveraged loans in Dealscan. Because Dealscan does not provide loan-level credit ratings, it is likely the investment-grade loans that we include in the analysis may contain unrated loans, which carry higher spreads than investment-grade loans.

Information on syndicated loans is also from Dealscan. To promote market liquidity, the highly competitive market for syndicated loans uses largely standardized contracts recommended by the Loan Syndication and Trading Association (LSTA). These contracts contain no bankruptcy-specific provisions that characterize DIP loans. As suggested by Becker and Ivashina (2016), the covenant-lite feature helps mitigate bargaining frictions among often a large number of syndicate members by reducing the likelihood of loan negotiations triggered by covenant violations. In contrast, any bargaining frictions are likely lower

for DIP loans due to their highly concentrated loan-ownership structure.

The first three columns of Table 3 present borrower and loan-package characteristics of DIP loans and matched investment-grade loans and leveraged loans. As expected, DIP-loan borrowers have significantly worse operating performance (ROA), higher leverage, lower cash holdings, and higher asset tangibility, and are more likely to be in a financially distressed industry than their matched issuers of leveraged loans or investment-grade loans. All three sets of firms have similar size in terms of book assets, which supports the matching exercise.

DIP loans are smaller as a fraction of book assets than matched investment-grade loans and leveraged loans, which are twice as large. The loan types are comparable. Importantly, DIP loans have much shorter maturity and are much more likely to have financial covenants and prepayment sweeps than matched loans. Comparing the specific type of covenants among these three sets of loans, we find that DIP loans are ten times more likely to include covenants on liquidity and cash level and EBITDA level than matched loans. Restrictions on capital expenditure or production are also more likely to be included in DIP-loan contracts.

Leverage ratio and coverage ratio covenants are less likely to be imposed in DIP loans than matched loans. This finding is perhaps not surprising as such ratios are less relevant to a firm already in bankruptcy. Furthermore, DIP loans are more likely to contain mandatory prepayment clauses related to asset sales than both types of matched loans. However, leveraged loans are more likely to impose extra cash sweep than DIP loans. These two types of loans have comparable inclusion of debt issuance sweep. In comparison, a very low fraction of investment-grade loans contain prepayment clauses.

Our contemporaneous matching procedure possibly fails to control for unobservable heterogeneity between our Chapter 11 firms and the matched borrowers. While unlikely to be correlated with DIP-loan repayment risk (which is empirically close to zero), there is likely latent heterogeneity in the underlying asset risk of debtors. To the extent that such heterogeneity does affect loan terms, holding the borrower constant when comparing DIP-loan terms and terms of leveraged loans adds power to our test. Therefore, in the second procedure, we match a DIP-loan package to syndicated loan packages obtained by the bankrupt firm in either three years or one year prior to its Chapter 11 filing. The analysis is similar in its motivation to the comparable (non-DIP) loan pricing analysis in Murfin and Pratt (2019) as well as to the comparison of loans and bonds issued by the same (non-bankrupt) firm in Schwert (2018).

The characteristics of pre-bankruptcy borrowers and loans are presented in columns (4) and (5) of

Table 3. We find that on average, Chapter 11 firms that obtain loans before their bankruptcy filings are larger than the same firms when getting DIP loans. Not surprisingly, these firms have better operating performance and lower leverage before bankruptcy than at the time of bankruptcy. Their asset tangibility is comparable but a Chapter 11 firm's industry is more likely in distress than a few years ago before its bankruptcy filing.

Comparing terms of DIP loans with those of pre-bankruptcy loans, we find that DIP-loan size as a fraction of book assets is smaller than that of loans obtained within three years before bankruptcy but comparable to those obtained right before bankruptcy. Although revolvers are more likely to be included in a DIP-loan package, the use of term loan is comparable across these three sets of loans. Furthermore, DIP loans have much shorter maturity and are more likely to include financial covenants than pre-bankruptcy loans. Interestingly, despite more frequent use of prepayment sweep by DIP loans than pre-bankruptcy loans obtained three years prior to bankruptcy, the use of asset sale sweep of DIP loans is comparable to that of pre-bankruptcy loans obtained one year prior to bankruptcy. The evidence suggests that as a firm becomes deeply distressed and thus is likely to implement asset restructuring, lenders are more inclined to include prepayment clauses on asset sales.

To conclude, DIP loans represent a smaller share of the overall liabilities of the debtor, have shorter maturity, and are more likely to include restrictive covenants and mandatory prepayment clauses than the four sets of matched loans. This shows that, through contracting, DIP lenders are able to separate loan risk from borrower asset risk to a much greater degree that the case is for loans outside of bankruptcy.

5 DIP-loan pricing

In this section, we document DIP-loan spreads and fees and compare them with those of matched loans outside of bankruptcy. The main purpose is to examine whether DIP-loan pricing is commensurable with the low repayment risk documented above.

5.1 Spreads and fees in DIP loans

For each facility in a DIP-loan package, we collect information on the amount, interest, and fee from motions and master credit agreements.[6] We retrieve monthly three-month LIBOR rates, U.S. prime

[6]The interest charged on DIP facilities is typically expressed as a spread over one or several reference rates, with LIBOR, U.S. prime rate, and federal funds rate being the most common. At times, interest is expressed as a fixed rate. Lenders

rates, and federal funds rates from Bloomberg and determine the rates applicable in the month of the final approval of the DIP loan by the judge.[7] It is worth pointing out that, with 90% coverage, our sample has one of the most comprehensive coverage of loan fees in the literature (Berg, Saunders, and Steffen, 2016; Hasan, Ramirez, and Zhang, 2019). Also, while typically available through our hand-collected data from motions and credit agreements, Dealscan's fee data miss (ex post) expense reimbursement information, such as ordinary fees and out-of-pocket expenses incurred by DIP-loan providers in negotiating and drafting the loan agreement, and expenses in monitoring participants in the Chapter 11 case. This type of reimbursement arrangement is not available for loans outside of bankruptcy.

Table 4 provides summary statistics for the 545 loan facilities in our sample. We find that 64% of the facilities are revolvers and the rest are term loans. The mean (median) amount of each facility (either revolver or term loan) is \$244 million (\$75 million), and the mean (median) ratio of facility amount to book assets is 0.101 (0.071). The mean (median) maturity is 10 (9) months, and 99.3% of the facilities are secured. The mean (median) LIBOR spread is 628 bps (587 bps). For a subsample of 75 loan facilities that quote fixed rates, both the mean and the median rates exceed 1,000 bps.

As shown in Table 4, DIP lenders charge a variety of fees.[8] The upfront fee includes closing fee, issue discount, underwriting and arranger fee, structuring fee, agent fee, and monitoring fee. The annual fee is an annual charge on the entire commitment amount, and the commitment fee is charged on the portion of the commitment amount that is unused. Besides these common types of fees, lenders can impose an extension fee (charged when extending the loan maturity), an exit fee (charged upon exit or termination of a facility), and a default fee (charged if default occurs).

The DIP-loan fees are also large relative to investment-grade loans outside of bankruptcy. The mean upfront, annual, and commitment fees are 104 bps, 35 bps, and 83 bps, respectively. In addition, DIP-loan facilities charge, on average, 6 bps in extension fee, 60 bps in exit fee, and 219 bps in default fee. In dollar terms, the interest cost for our sample firms is \$7.2 billion (constant 2019 dollars). To provide a perspective on these fees, note first that LoPucki and Doherty (2004) estimate legal and professional

often impose a floor rate on the reference rate. In situations where the reference rate is below the floor, the floor rate will serve as the reference rate.

[7]For loan facilities in our sample that are not quoted over LIBOR, we express the loan spread over LIBOR as follows: First, if the rate is expressed as a spread over the prime rate or federal funds rate only, we adjust the spread by the difference between the three-month LIBOR and the reference rate in that month. Second, if the interest of a DIP facility is expressed as a fixed rate, we calculate the difference between the fixed rate and three-month LIBOR as LIBOR spread. This procedure allows us to report LIBOR spread for all loan facilities in our sample that have information on loan interest.

[8]We convert all fees expressed in dollar terms to basis points by scaling fees with the dollar value of the facility amount.

fees paid in bankruptcy to average 1.4% of debtors' prepetition assets. Using this percentage, the total upfront and annual fees paid by our sample firms sum to $1.1 billion and $229 million, respectively. With this, we estimate that the DIP-loan providers in our sample receive a total of $8.5 billion in interest and fees.

Turning to the spreads in Table 4, the mean (median) AISD with spread and annual fee combined is 658 bps (605 bps).[9] This average is substantially higher than what has been documented in prior work. For example, Chatterjee, Dhillon, and Ramírez (2004) find that the median DIP spread is 460 bps for a sample of 106 DIP loans over the period 1988–1997. Daniels and Ramirez (2008), who examine DIP loans over the period 1988–2004, document an average spread of 368 bps, while Hasan, Ramirez, and Zhang (2019) show an average spread of 386 bps using a more recent sample. In addition, examining the pricing of 96 DIP loans from 2004–2012, Tung (2020) documents an average (median) all-in spread drawn of 531 bps (450 bps).[10]

What is the expected default rate for loans priced with a spread of 628 bps? According to S&P Capital IQ Leveraged Commentary & Data over 1981–2019 (Table 24 in S&P, 2019), this loan spread is comparable to a leveraged loan rated single B with an average one-year default rate of 3.33%. This, of course, is much higher than the repayment-risk reported for our DIP-loans in Section 4.2, which falls in the low range of investment-grade loans.

5.2 Pricing of DIP loans versus pricing of matched loans outside of bankruptcy

In this section, we compare DIP loans with the four types of matched loans from Section 4.3. Consistent with the evidence in Table 3, Table 5 shows that DIP-loan facility as a fraction of book assets is smaller than that of matched investment-grade loans, leveraged loans, and pre-bankruptcy loans obtained three years prior to bankruptcy filing but comparable to that of loans obtained within one-year of bankruptcy filing. DIP loans have much shorter maturity and almost all DIP-loan facilities are secured. Because of their smaller loan size, shorter maturity and higher collateralization, DIP loans should carry lower spreads than loans of comparable payment default risk. For example, the recent evidence in Benmelech, Kumar, and Rajan (2020) is consistent with loan security lowering the financing cost of low-quality firms.

[9] Following Dealscan, we define all-in spread drawn (AISD) as the sum of LIBOR spread and annual fee.

[10] Overall, these lower average spreads can be attributed to a combination of a limited coverage of DIP loans by Dealscan (from which all prior studies extract DIP-loan information), prior studies' failure to differentiate between initial DIP loans at the time of a Chapter 11 filing and subsequent amendments, and pricing errors in Dealscan. We explain these pricing errors in Table OA3 and Online Appendix Figure OA1.

Perhaps most surprising, in Table 5, the mean differences in LIBOR spreads between DIP facilities and their matched investment-grade loan and leveraged-loan facilities are 492 bps and 295 bps, respectively; the mean AISD differences are 520 bps and 317 bps, respectively. The average LIBOR-spread difference between DIP loans and leveraged loans is significant also in economic terms: It represents approximately a 90% (100*295/333) premium in annual interest expenses over and beyond those paid by the matched leveraged-loan borrowers. Even more striking, DIP borrowers pay interest that is almost *five times* that paid by borrowers of investment-grade loans.

Figure 3 plots the average LIBOR spread and AISD in DIP loans, and in matched leveraged loans and investment-grade loans, over the period 2002–2019. The average spread on DIP facilities in our sample is in the range of 400 bps to 600 bps before the financial crisis of 2008–2009. During the crisis, the average spread jumps to above 800 bps and remains high at 700 bps after. More importantly, Figure 3 confirms a large and persistent difference in LIBOR spreads and AISD between DIP loans and leveraged loans (as well as between DIP loans and investment-grade loans). This difference starts out at about 200–400 bps at the beginning of the sample period (year 2002) and reaches about 400–600 bps with the onset of the financial crisis and thereafter. Also interesting, the post-crisis jump in the DIP-loan spreads relative to matched loans is not explained by our evidence on DIP-loan payment defaults, which remains low throughout the entire sample period. It does suggest, however, that DIP lenders are skillfully able to structure their loans, manage their borrowers and select investment opportunities to avoid suffering higher levels of loan loss even across adverse economic cycles.

Furthermore, Figure 4 shows the frequency distribution of LIBOR spreads on DIP loans (Panel A), on industry- and size-matched leveraged loans in Dealscan (Panel B), and on industry- and size-matched investment-grade loans in Dealscan (Panel C). In Panel A, the mass is centered around 600 bps with a fat right tail reaching 1,800+ bps. In Panel B, the mass is centered around 300 bps with much less fat right tail, and in Panel C the mass is centered around 100 bps with a short right tail. Notwithstanding our evidence of a near-zero repayment risk, Figure 4 again confirms that DIP-loan spreads are substantially higher than those on the matched leveraged loans (not to say the investment-grade loans).

Consider next columns (4) and (5) of Table 5, where we present contractual terms of loan facilities obtained by the same bankrupt firm within the three-year or one-year period prior to Chapter 11 filing. As expected, pre-bankruptcy loans are more likely to be term loans, and on average have much longer maturities (about four years versus ten months for DIP loans). More importantly, DIP-loan spreads are

again substantially higher than those on within-firm matched loans: The difference in LIBOR spreads (AISD) averages 273 bps (292 bps) for loans taken out within three years prior to Chapter 11 filing, and averages 171 bps (200 bps) for loans taken out within one year prior to filing. In the latter case, according to S&P's ratings from Compustat—available for a subset of our sample firms—many of those borrowers have an issuer credit rating of CCC or lower prior to their bankruptcy filings. In other words, DIP-loan spreads on average exceed spreads paid by the same CCC-rated borrower only one year earlier.

Table 5 further shows that DIP loans come with fees that are also large compared with those of the matched loans. The average difference in upfront fee between DIP loans and matched investment-grade and leveraged loans is 90 bps and 53 bps, respectively, and the average difference in the sum of annual and commitment fees is 95 bps and 81 bps, respectively.[11] The average difference in total fees is 191 bps when investment-grade loans are used as benchmark and 140 bps when leveraged loans are used. That is, DIP loans charge upfront, annual, and commitment fees that on average six times those for investment-grade loans and nearly triple those associated with leveraged loans. Fees on DIP loans and those on pre-bankruptcy loans significantly differ as well: The average difference in upfront fee is 58 bps (74 bps) between DIP loans and loans issued within three years (one year) prior to Chapter 11 filing, and the corresponding difference in the sum of annual and commitment fees is 86 bps (81 bps).

Finally, while not tabulated, in separate analyses (available upon request) we obtain matched leveraged loans by using not only firm size, industry, and year of issuance but also facility type, security, and syndicate size. These refined matching procedures produce differences in spreads between DIP-loan facilities and matched leveraged-loan facilities that are similar to those presented in Table 5. In sum, our evidence suggests that both DIP-loan spreads and fees are high relative to what one would expect given their low repayment risk. To address this puzzle, we next provide new evidence on the DIP-loan placement process itself, which addresses the degree of competition (or lack thereof) among potential suppliers of DIP loans.

6 The DIP-loan placement process: A closer look

In this section, we use textual analysis of DIP-loan motions to highlight the DIP-loan solicitation process and the resulting lender type. Specifically, we distinguish between two types of prepetition secured

[11] Due to differences in data coverage for LIBOR spread, annual fee, commitment fee, and AISD in Dealscan, the mean of the sum of LIBOR spread and annual fee does not add up to the mean of AISD.

lenders: relationship lenders and non-relationship lenders, where the latter includes lenders who may have purchased debtors' loans prior to bankruptcy for opportunistic reasons.

6.1 Lender solicitation

As emphasized in Section 2.2 above, debtors trying to run a competitive process for arranging a DIP loan worry that news of a potential bankruptcy filing may create public-relations risks and cause value declines. Nonetheless, many debtors are still willing to solicit bids from both prepetition lenders and other potential financiers known to be specialized players in the DIP-loan market. To measure variations in this solicitation process across our sample, we search DIP-loan motions for indications that the debtor "searched," "solicited," or "surveyed" potential lenders for DIP financing. We then use this information to determine the number of lenders approached, the number of lenders interested, and whether a formal bidding process is held after the debtor has received multiple interests. While evidence of a formal bidding process would provide the most direct indication of competition, a solicitation process that generates interest among potential lenders may also put pressure on, say, a prepetition secured lender who ultimately agrees to provide the DIP loan.

The descriptive information in Table 6 shows that in 70% or 253 of the 362 DIP-loan packages, the debtor indicates to the court that it has approached prospective lenders. In 136 of these 253 cases, the debtor also reports the number of actual number of potential lenders approached. In the remaining cases the debtor either states "many" (or uses similar wording) when referring to the number of lenders surveyed—or omits this information altogether. Furthermore, in 184 of the 253 cases, the debtor reports the actual number of interested lenders, which averages 4.5 (median 3).[12] In 62 (one third) of the 184 cases, the debtor reports a single interested lender (or lending group), who is almost certain to be a prepetition lender. Overall, of the 362 loan packages, the debtor receives interests from more than one lender in 122 cases (one third). Most importantly, a formal round of bidding occurs in only 32 cases or a tenth of the total sample of 362 DIP-loan packages. The low level of formal bidding shows that the typical DIP-loan solicitation process lacks competition from potential outside lenders.

Next, we examine whether a debtor's effort in seeking alternative lenders and drumming up compe-

[12]Often a group of interested lenders form a syndicate and submit only one bid, which we treat as one lender.

tition is associated with lower loan spreads, using the following OLS regression:

$$Spread_i = \beta Solicitation_i + \gamma Contract_i + \lambda Firm_i + \alpha_{ind} + \alpha_{year} + \alpha_{loan\ type} + \varepsilon_i, \quad (1)$$

where $Spread_i$ is either LIBOR spread or AISD on loan facility i. The variable of interest, $Solicitation_i$, is an indicator variable taking three alternative forms (one at a time): (1) the debtor approaches prospective lenders, (2) the debtor approaches the median (12) number of lenders, and (3) the number of interested lenders is above the median of three. The control variables in this regression include the two vectors $Contract_i$ of loan contract features and $Firm_i$ of borrower characteristics. The regression also includes Fama-French (FF12) industry fixed effects (α_{ind}), year fixed effects (α_{year}), and loan type fixed effects ($\alpha_{loan\ type}$). Standard errors are clustered at the year level.

Table 7 presents the regression results. In columns (1) and (2), we do not find any significant association between the indicator variable for a debtor approaching prospective lenders and loan spreads. In columns (3) and (4), when limiting to a sample of debtors who provide the number of prospective lenders approached, we still find no significant association between the indicator variable for a debtor approaching the above-median number of lenders and loan spreads. However, in columns (5) and (6), we limit the sample to debtors who provide the number of interested lenders and examine whether loan spreads are lower when the reported number of interested lenders exceeds the median of three. Here, the estimated parameter β is negative and statistically significant at the 1% level. The parameter value indicates that, when the number of interested lenders exceeds the sample median, DIP loans are associated with 152 bps (or 24%) lower spreads (whether using LIBOR spreads or AISD).

Among the control variables, we find that facility size and firm leverage are negatively and significantly associated with spreads at the 1% level. Although Leverage is statistically significant in explaining spreads, its economic significance is small. Using the coefficient on Leverage in column (1), an interquartile change in Leverage in our sample (from 0.81 to 1.20) is associated with a drop in spreads by 25 bps, a tiny change relative to the average spread of 628 bps. Importantly, we do not find that lender protections including covenants and prepayment clauses, or other borrower characteristics, are associated with spreads as reported in the extant literature. While not tabulated, in contrast to our results in Table 7 for DIP loans, we find in untabulated analysis that loan security, financial covenants, firm size, ROA, and leverage all have strong explanatory power for the spreads of matched investment-grade and leveraged-

loan facilities. The economic significance of these variables is also large. For example, we find that investment-grade and leveraged-loan facilities with financial covenants have spreads that are 29 bps and 44 bps (or 21% and 13% of the mean) lower than those without such covenants, respectively. The evidence suggests that leveraged loans are priced to reflect both creditor control and borrower risk, in stark contrast to DIP loans.

These results show that, while debtors to some degree solicit the interest of potential DIP-loan suppliers, the process of obtaining DIP loans is far from competitive. Having said that, when debtors do receive competing bids (measured according to our best effort), DIP-loan spreads are lowered by 152 bps. This suggests that when more lenders appear to be interested in providing financing, interest expenses are lower. In other words, it appears that loan pricing does respond somewhat to market conditions and asset quality. Debtors who are particularly active in soliciting bids obtain lower DIP-loan spread, possibly because such solicitation helps debtors bargain with prepetition secured lenders in setting the spread. To examine more specifically the role of prepetition secured lenders, we next turn to the type of debtors that is relatively likely to be financed by such lenders.

6.2 Prepetition secured lenders

As discussed in Section 2.1, when securing a DIP loan requires priming the collateral of prepetition secured lenders, those lenders must first give their consent—or otherwise provide the DIP-loan themselves. Prepetition secured lenders may have a particularly strong incentive to supply the DIP loan themselves when it allows a roll-up of their prepetition secured debt into the DIP loan. On the other hand, the incentive to provide the DIP loan may be weaker when their prepetition loans are already over-collateralized, or when prepetition lenders for other reasons agree to a DIP loan supplied by new lenders. To sort out these incentives, we estimate the determinants of the likelihood that prepetition secured lenders provide DIP financing as a function of firm characteristics.

Using hand-collected information in DIP loans and master credit agreements, we identify the name and institutional type of lead lenders of DIP loans such as book runner, agent bank, syndication agent, and so on; the type of a debtor's prepetition debt; as well as the identity of lead prepetition lenders at the time of bankruptcy filing. We also resort to Capital IQ, debtors' SEC filings immediately before bankruptcy, and Dealscan for such information. We note that the background section of motions for DIP financing does not list all the lenders of prepetition loans and nor do other sources such as debtors' SEC

filings. Our classification as to whether a DIP loan is provided by prepetition lenders is therefore based on whether any of the lead lenders of a prepetition loan are also lead lenders of a DIP loan as disclosed in motions. We can identify whether DIP lenders hold prepetition debt in a non-leading role only if such information is disclosed. This does not rule out the possibility that a DIP lender can be a non-lead prepetition lender, but motions do not provide such information (and as a result, we fail to capture it).

The above comprehensive approach is superior to using lender identities at loan initiation from Dealscan (as prior studies have done) because it allows us to capture all secured lenders immediately before bankruptcy filing, including those entering the scene through distressed loan trading. Our data sources allows us to determine whether a DIP lender is a prepetition secured creditor, an unsecured creditor, or a major shareholder, including being the parent company. We find that 83% of the DIP loans are provided by prepetition creditors and shareholders, and 79% are provided by prepetition secured lenders who mostly hold secured bank loans.

We use the logit regression reported in Table 8 to identify the firm characteristics that are associated with debtors obtaining DIP loans from prepetition secured lenders. The differences in characteristics of debtors who borrow from prepetition secured lenders (versus those who do not) are as follows. First, debtors with low cash holdings, a marker for short-term financial constraints and liquidity needs, are more likely to borrow from prepetition secured lenders. Second, debtors in prepackaged and prenegotiated cases are more likely to borrow from prepetition secured lenders. This is as expected given that prepetition lenders are often sponsors of RSAs (Ayotte and Elias, 2020). RSA is typically negotiated between a debtor and some of its lead lenders before bankruptcy filing. While RSA helps speed up the restructuring and voting process, prepetition secured lenders often package DIP loans into RSA and make a combined offer that a debtor finds hard to reject. Third, when a debtor's ratio of bank loan to assets is high—suggesting that prepetition lenders' claims are large and hence more highly under-collateralized—they are also more likely to obtain DIP financing from prepetition secured lenders.

The results in Table 8 point to some of the frictions likely facing a Chapter 11 firm when considering raising DIP financing from outside lenders: a lack of unencumbered assets available to pledge for the new financing coupled with a dire short-term liquidity constraint. These frictions enhance prepetition secured lenders' power to block outside lenders while at the same time enhancing their power to demand high spreads and fees—notwithstanding the extraordinary repayment protection provided by the DIP-loan

contract itself.[13] Having said that, bargaining power likely differs within the group of prepetition secured lenders underlying Table 8. Specifically, some of these lenders are relationship lenders with superior information about the debtor, while others purchased the secured debt just prior to bankruptcy. Hence, we next examine whether there are significant differences in loan spreads between DIP loans provided by these two types of prepetition secured lenders.

6.3 Relationship lending

We classify a prepetition lender as having a lending relationship with the debtor based on information extracted from both court motions and Dealscan. As per our definition in Table A.1, a lending relationship exists if a DIP lender provides at least one loan to the debtor over the five-year period preceding Chapter 11 filing. With this definition, prepetition lenders have a lending relationship with the debtor in 54% of the 545 facilities in our sample. Moreover, loans provided by relationship lenders account for 44% of the total number (and 46% of the value) of loans obtained by the debtor during the five-year period prior to bankruptcy filing. Overall, as 79% of our DIP loans are supplied by prepetition lenders, 68% (54%/79%) of the DIP loans are provided by prepetition secured lenders with a lending relationship. The remaining prepetition lenders likely have purchased their debt claims shortly prior to the bankruptcy filing.

We note that our 79% share of DIP-loan providers being prepetition lenders is substantially higher than what has been reported in previous studies. In particular, Hasan, Ramirez, and Zhang (2019) report this share to be only 36%. The main reason for this difference is that, while we determine prepetition lenders using court motions and master credit agreements, prior studies use Dealscan for this determination. Among other things, Dealscan tends to miss prepetition lenders emerging via secondary market loan trading in during the runup to a debtor's Chapter 11 filing.

We are interested in whether DIP-loan spreads charged by prepetition secured lenders tend to differ between relationship lenders and non-relationship lenders. On the one hand, the extant literature suggests that, outside of bankruptcy, relationship lenders' superior information about a borrower allows them to lend at lower spreads (see, for example, Bharath, Dahiya, Saunders, and Srinivasan (2011)). On the other hand, using a sample of 348 DIP loans over the period 1988–2012, Hasan, Ramirez, and Zhang (2019)

[13] In untabulated analysis, using the number of claim classes (in natural logarithm) listed in the confirmed reorganization and liquidation plan, we find that firms with a larger number of claim classes are also more likely to obtain DIP financing from prepetition secured lenders. This is intuitive as new lenders tend to shy away from complex cases whose restructuring involves large uncertainty. It suggests that case complexity may also constitute a source of friction for bankrupt firms when it comes to soliciting bids from outside lenders.

find support for a lock-in effect of relationship lending on spreads whereby prior lending relationship is associated with higher DIP-loan spreads. With our unprecedented DIP-loan sample and hand-collected information on lead lenders, we revisit the implication of relationship lending for DIP-loan spreads.

In Table 9, we employ the same regression specification as Eq. (1) but replace $Solicitation_i$ with the following three measures of lending relationship (one at a time): (1) *DPrior*, a binary variable indicating whether a relationship lender provides the DIP loan, (2) *Relationship lender(number)*, the number of loans provided to the debtor over the past five years, and (3) *Relationship lender(amount)*, the amount of loans provided to the debtor over the past five years. The dependent variable is again either LIBOR spread or AISD, while the regression is performed on the subsample of DIP loans that are provided by prepetition secured lenders.

In columns (1) and (2) of the table, the two coefficient estimates on *DPrior* are negative but statistically insignificant. This evidence suggests that, notwithstanding their relative informational advantage, prepetition secured relationship lenders do not charge lower loan spreads than prepetition secured but non-relationship lenders. Columns (3)–(6) show that spreads decline as the lending relationship strengthens, with the coefficient estimates for *Relationship lender(amount)* in columns (5) and (6) being significant at the 5% level. Note, however, that the economic magnitude is small: A one-standard-deviation change in *Relationship lender(number)* (*Re-lationship lender(amount)*) is associated with a 37–41 bps (45–47 bps) reduction in loan spreads, representing about a 7% drop in the mean DIP-loan spreads.

We also explore whether unobservable heterogeneity across lead lenders helps explain the cross-sectional variation in DIP-loan spreads by including lead-lender fixed effects in our spread regressions. There are 259 unique financial institutions that provided DIP financing to our sample of Chapter 11 firms, and the top ten institutions financed more than two-thirds of the DIP-loan packages in our sample. In the lead-lender fixed effects regressions, if a DIP loan is provided by more than one lead lender, we keep the most active lead lender in each deal. As shown in Table OA4, F-tests for the joint significance of lead lender fixed effects strongly reject the null that lead-lender fixed effects are jointly equal to zero, and that adding these fixed effects to the full regression model increases the adjusted R^2 by 18% for AISD. This shows that lending institution heterogeneity has some statistical power in explaining the cross-sectional variation in DIP-loan spreads.

In sum, our evidence suggests that, while relationship lenders exploit their informational advantage and charge spreads that are slightly lower than otherwise similar loans provided by outsiders, the spreads

remain high compared with a risk-adjusted benchmark based on investment-grade and leveraged loans outside of bankruptcy.

7 Why the high DIP-loan spreads?

Recall from Table 5 that the average DIP-loan AISD of 658 bps is almost five times the average spread on matched investment-grade loans, and almost double the average spread on matched leveraged loans issued outside of bankruptcy. DIP-loan spreads are also high in comparison with spreads on high-risk distressed loans issued by the same bankrupt firms within three years—and even one year—of their Chapter 11 filings. Since Section 4.2 shows that DIP-loan repayment risk is no higher than that of investment-grade loans outside of bankruptcy, this evidence challenges the conventional view that spreads cover a competitive compensation for credit risk. In this section, we further discuss the two alternative views of this DIP-loan spread puzzle raised in the introduction: Monitoring-cost compensation (in addition to the loan fees) and rent extraction (sharing of the debtor's preservation of going-concern value made possible by the DIP loan).

7.1 Monitoring-cost compensation?

Restrictive contract terms trigger expectations of monitoring costs. Recall from Table 4 that lenders receive compensation in the form of numerous fees, which in sum are substantially higher than the fees in our matched investment-grade and leveraged loans (Table 5). This despite the fact that DIP-loan providers receive much more frequent updates from the debtor about budget and cash positions (Tung, 2014). Moreover, the high creditor-ownership concentration of DIP-loans by itself enhances effective monitoring (Sufi, 2007) and lowers loan renegotiation costs (Demiroglu and James, 2015) relative to loans outside of bankruptcy. Also relevant, in addition to fees, debtors regularly choose to reimburse DIP-loan providers for reasonable expenses associated with financial and legal advisors in connection with the financing. This reimbursement covers fees and out-of-pocket expenses incurred by lenders' lawyers in negotiating and drafting the DIP financing loan agreement, DIP motion, and related documentation, as well as expenses in monitoring and otherwise participating in the Chapter 11 case.[14]

[14]We thank David R. Seligman at Kirkland & Ellis LLP, a leading US law firm dealing with large Chapter 11 bankruptcies, for his help in understanding this particular fee- and expense-related feature of DIP-loan contracting. It means that the fees reported in this study represent a lower bound on the actual payment from the borrower to the debtor over the term of the loan.

In the case of credit lines, which Table 2 above shows are present in 83% of our DIP-loan packages, the extant banking literature derives the following three-part pricing principle (Thakor and Udell, 1987; Boot, Thakor, and Udell, 1987; Eckbo, Su, and Thorburn, 2022): (1) Loan spreads cover credit risk. (2) Loan origination costs, which are incurred (and sunk) upfront, are optimally covered by the upfront fee. (3) Costs associated with various future contingencies are covered by periodic fees over the loan term. Consistent with this general principle, the fee evidence in Table 4 above shows that DIP-loan providers—beyond the upfront (loan origination) fee—indeed use several fee types to cover potentially costly debtor contingencies, including a loan extension fee, bankruptcy exit fee, and an ultimate default fee. This fee structure comes in addition to any contractual out-of-pocket compensation for ongoing monitoring expenses mentioned above. It indicates that lenders implement a comprehensive set of fee-instruments designed to cover expected monitoring costs associated with various covenant violations and renegotiations over the term of the loan.

Furthermore, recall that the loan spread alone—not fees—prices default risk, which involves considering the repayment-risk history available through Moody's and other rating agencies. Reserving the spread for this normal pricing function, rather than also adding a monitoring-cost component on top of the spread, is necessary to effectively communicate to the debtor's various claim-holders and the court that the loan price is indeed fair and reasonable, as required by the U.S. Bankruptcy Code. In sum, notwithstanding the unobservability of monitoring costs, it is difficult to argue that the negotiating parties would find it necessary to include a monitoring-cost component also in the spread itself.

7.2 Rent extraction (value sharing)?

A second and plausible explanation for the high loan spreads is the debtor's weak bargaining position. Recall that a DIP loan may be necessary to avoid a much more costly liquidation outcome. In these cases, since providing the short-term DIP loan helps preserve the debtor's going-concern value, it would not be surprising for the loan provider to demand and receive a share of this positive valuation effect. As explained in Section 2 above, senior secured prepetition lenders (who supply 79% of our DIP loans) are in a position to enforce this type of demand by outright blocking competition from potential outside loan providers. Also, it would not be surprising for the debtor to agree to transfer part of a value-increase triggered by the DIP loan in the form of a higher loan rate. This type of transfer is acceptable to junior creditors whenever the DIP loan is expected to avoid a more costly liquidation outcome.

Are the high expected DIP-loan spreads competed away ex ante in a quid pro quo arrangement? In other words, are debtors, when financially healthy, able to receive beneficial loan terms from the prepetition lender with the expectation that the same lender will be compensated for this benefit ex post via a high DIP-loan spread? Recall from Table 9 that there is no significant association between the variable *DPrior* and DIP-loan spreads, which fails to support the existence of such quid pro quo arrangements. To further address this issue, note that the variables *DPrior* and *Relationship lender* in Table 9 are all based on information available at loan initiation only. Since some of the prepetition lenders sell their loans prior to the debtor's bankruptcy filing, we replace these variables with an indicator that also captures changes in loan ownership after loan initiation. This replacement accounts for the fact that the secondary market for loans has become increasingly liquid over our sample period (Gande and Saunders, 2012; Berger, Zhang, and Zhao, 2021). While not tabulated, using this more precise prepetition relationship indicator also fails to support the quid pro quo hypothesis.

What are the incentives of debtor CEOs to go along with some degree of rent transfer through high DIP-loan spreads? Over the past two decades, there has been a shift towards stronger creditor control over the management of financially distressed firms. This shift is reflected in observations ranging from high CEO turnover around bankruptcy (Nini, Smith, and Sufi, 2012; Eckbo, Thorburn, and Wang, 2016) to improved corporate governance while in bankruptcy (Li and Wang, 2016). Also, Goyal and Wang (2017) show that incentive contracts offered to managers in bankruptcy tie their bonuses to creditors' recovery and asset sales, which tend to benefit *all* creditors—not just the most senior ones. Hence, the interests of management and creditors may for the most part be aligned when it comes to the DIP-loan spreads.[15]

Finally, the evidence and discussion in Section 6, which shows that the DIP-loan solicitation process rarely brings in competing bids, further supports the notion that the high DIP-loan spreads may contain a rent component. DIP loans are often negotiated under time pressure, with insufficient time to organize a full-fledged solicitation process. As pointed out in Section 2.1, the debtor also faces a potentially costly information externality: Since trade credit is unsecured in Chapter 11 bankruptcy, news that a firm is about to file under Chapter 11 could trigger a full stop in its supply chain, further increasing its financial distress costs. The same news could also put downward pressure on the market value of the firm's equity.

[15]Interestingly, while not tabulated here, a manual search of court dockets shows that junior creditors (primarily unsecured creditor committees and suppliers) file objections to various aspects of the DIP-loan terms in 60% of our sample. However, since we do not know the precise issues of contention, we leave a further analysis of these complaints to future research.

For these reasons, severely distressed firms may be reluctant to call for an open auction among potential DIP-loan providers.

8 Conclusion

This paper presents a large-sample analysis of the DIP-loan contract design, repayment risk and pricing. We begin by documenting that these super-priority loans are short-term, highly over-collateralized, and have a large number of restrictive covenants and milestones relative to matched loans outside of bankruptcy. We argue that this extraordinary level of control rights helps separate loan repayment risk from the debtor's underlying asset risk. Consistent with this argument, we document that *all* of our 545 DIP-loan facilities over the period 2002–2019 received full repayment (both face value and interest). Moreover, building on Moody's records on DIP-loan defaults back to 1988, we show that their repayment risk profile matches that of investment-grade loans.

As much as the near-zero repayment risk of DIP loans is surprising, so is our documentation of DIP-loan pricing. DIP lenders charge all-in spreads drawn that on average are five times higher than spreads of investment-grade loans and twice the average spreads of matched leveraged-loans, where the latter loan type has a far higher repayment risk. Moreover, DIP-loan providers receive compensation for loan origination and monitoring costs through fees that average six times those on investment-grade loans. This despite the fact that DIP-loan terms average only ten months (versus four years for the matched investment-grade loans), and have high ownership concentration and frequency of information disclosures—all of which should help lower (not increase) expected monitoring costs. Hence, the high DIP-loan fees make it difficult to argue that the negotiating parties choose to include a monitoring-cost component also in the spread itself.

However, a plausible interpretation of the high DIP-loan spreads is lack of supply-side competition, which may lead to rent extraction. The key restriction on competition is the blocking power of prepetition secured lenders when it comes to transferring (priming) their collateral to the DIP-loan provider. We show that this blocking right is actively exercised as these lenders become the de facto DIP-loan providers in nearly eighty percent of our sample. Our evidence of a lack of participation of new lenders in the DIP-loan solicitation process is therefore not surprising. Also interesting, we find no empirical support for the hypothesis that expected ex post rents from providing DIP loans are competed away through low loan

rates ex ante as lenders compete to provide loans to the firm outside of bankruptcy. If this were the case, we should find higher DIP-loan spreads among prepetition secured lenders than among new lenders, which we do not. We do, however, find that some debtors attempt to use the DIP-loan solicitation process to create competition among potential DIP-loan providers and that spreads are somewhat lower when this happens.

In sum, our evidence suggests that, fearing what could be a much more costly liquidation outcome, debtors agree to share some of the valuation upside (saved going-concern value) with DIP lenders—whether prepetition secured or new lenders. The high fraction of DIP loans provided by prepetition secured lenders further suggests that a prior lending relationship provides a competitive advantage among potential suppliers in terms of a cost-efficient handling of the unique circumstances surrounding these important loans. Having said that, our unique evidence on the DIP-loan solicitation process also suggests that promoting a more intensive search and bidding process, while difficult in many cases, can help to lower spreads and fees.

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Figure 1: **Annual distributions of the sample of 578 firms filing for Chapter 11, 2002–2019**

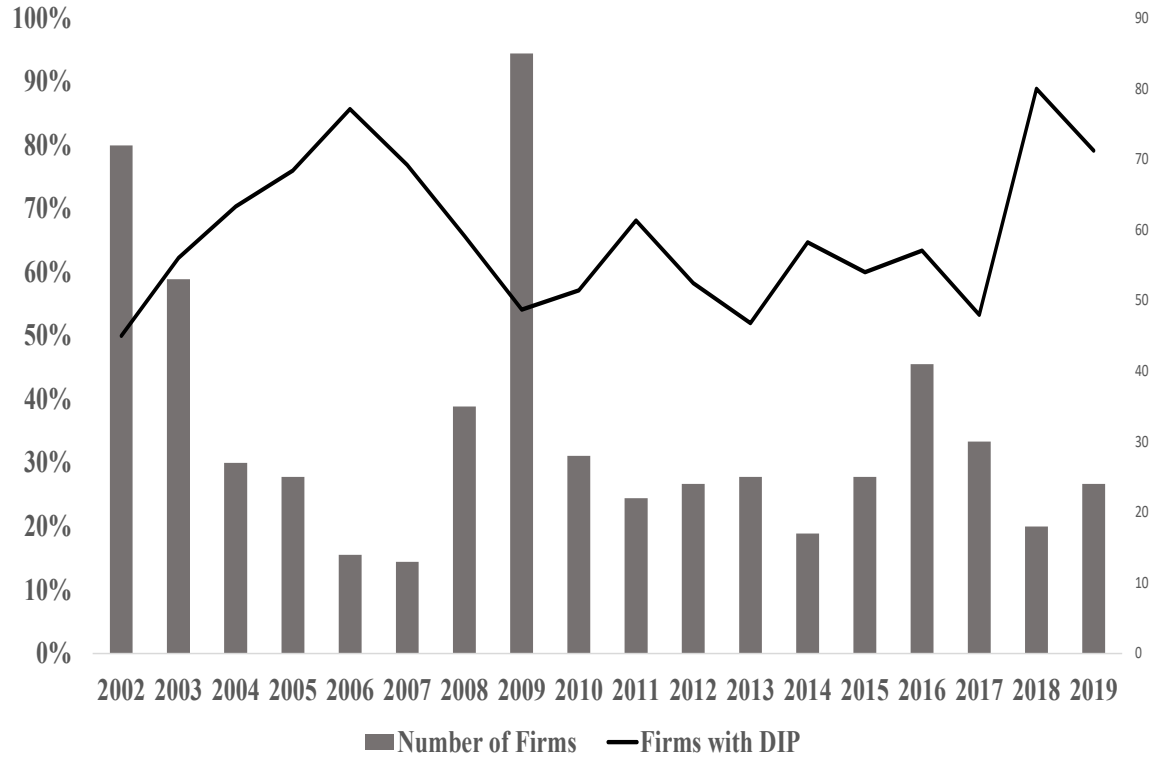


Figure 2: Industry distributions of the sample of 578 firms filing for Chapter 11, 2002–2019

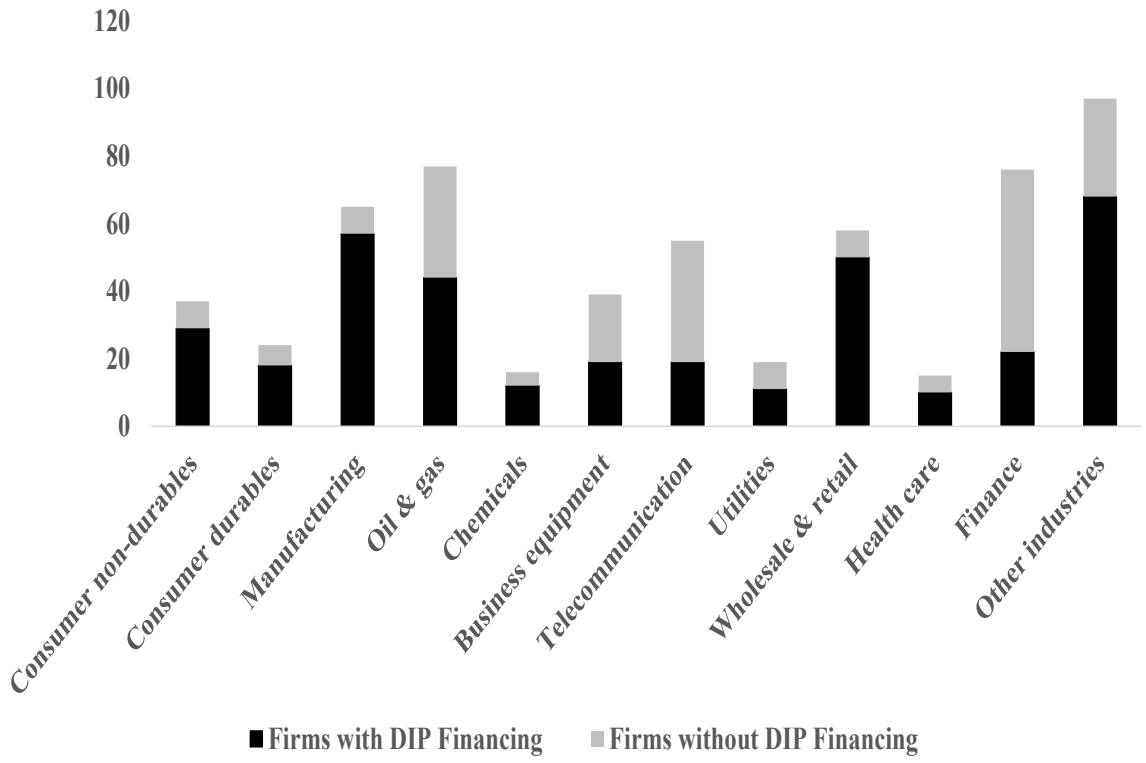


Figure 3: Annual average loan spreads on DIP loans, and on matched leveraged loans and investment-grade loans, 2002–2019

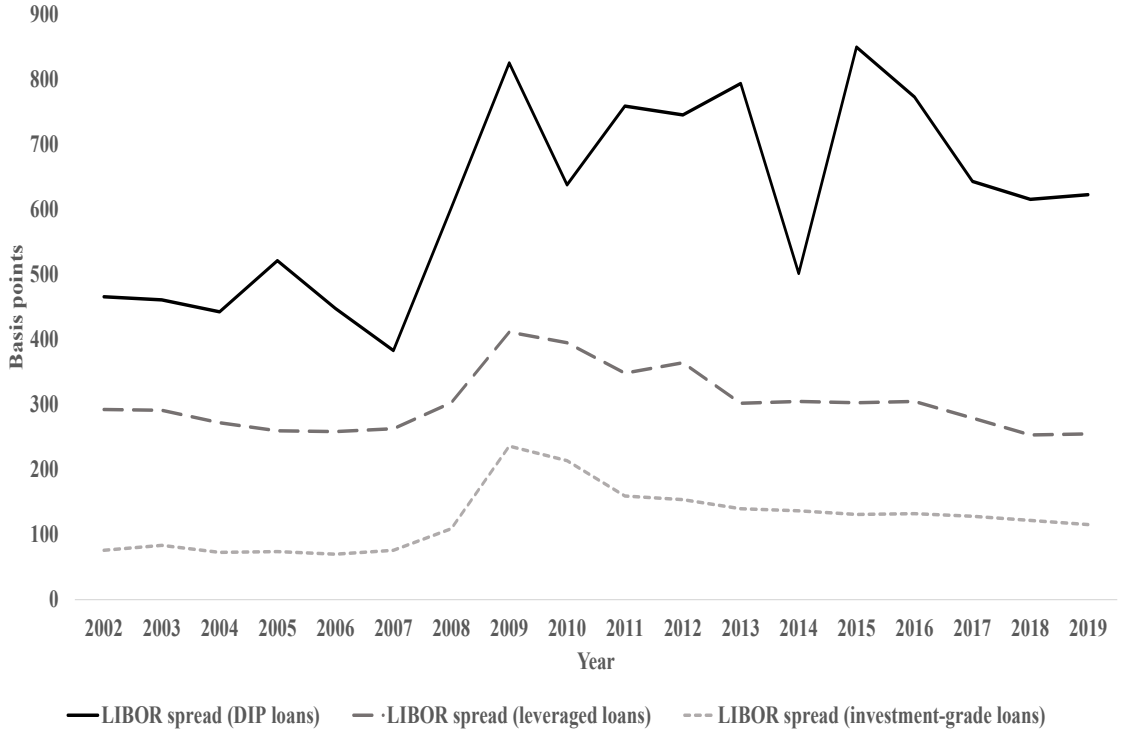
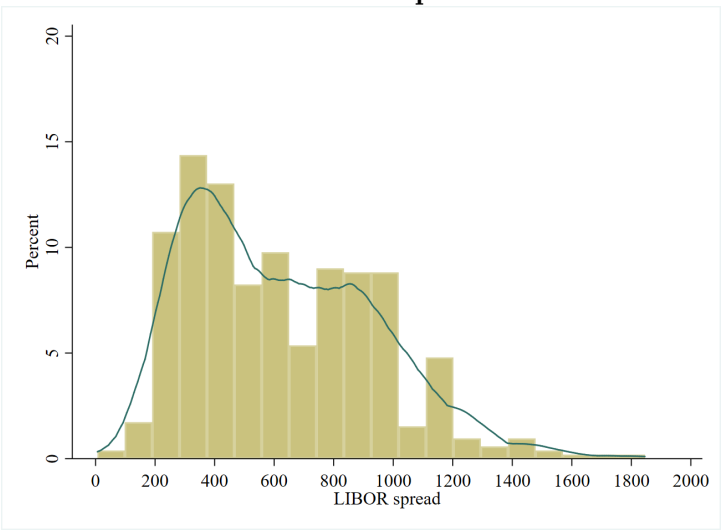
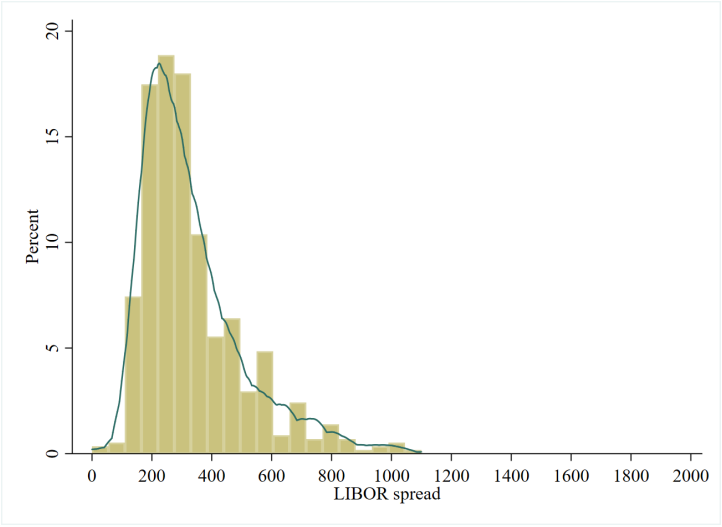


Figure 4: **Frequency distribution of loan spreads on DIP loans (Panel A), matched leveraged loans (Panel B) and investment-grade loans (Panel C), 2002–2019**

A: DIP-loan spreads



B: Matched leveraged-loan spreads



C: Matched investment-grade-loan spreads

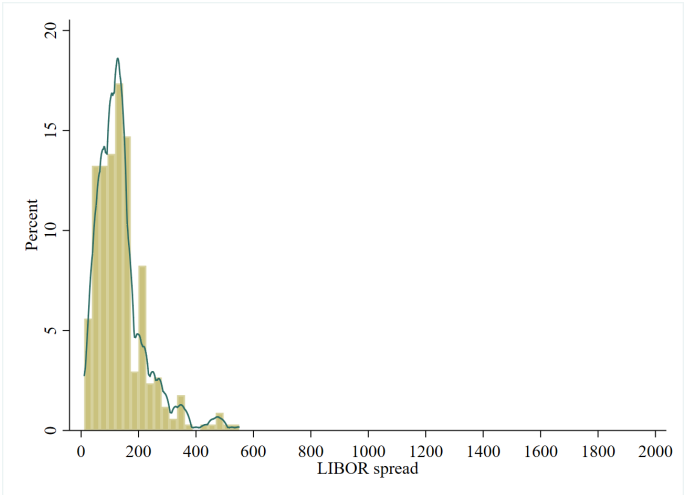


Table 1: **Summary statistics of Chapter 11 firms with and without DIP loans**

	Firms with DIP loans			Firms without DIP loans			p-value for differences[a]	
	N	Mean	Median	N	Mean	Median	in means	in medians
A: Firm characteristics								
Assets	359	3,575	799	219	7,664	959	0.148	0.208
ROA	341	0.024	0.051	208	-0.071	0.015	0.001	0.000
Leverage	342	1.064	0.965	210	1.117	0.968	0.277	0.706
Cash	344	0.054	0.031	210	0.125	0.086	0.000	0.000
Tangibility	342	0.393	0.357	208	0.354	0.344	0.117	0.042
Industry distress	351	0.208		213	0.216		0.822	
Bank loan/assets	359	0.271	0.193	219	0.242	0.120	0.289	0.001
B: Chapter 11 characteristics and outcome								
Delaware	359	0.432		219	0.374		0.175	
NYSD	359	0.253		219	0.201		0.148	
Prepack	359	0.334		219	0.315		0.634	
Emergence	359	0.663		219	0.534		0.002	
Liquidation/conversion	359	0.206		219	0.361		0.000	
Acquisition	267	0.086		173	0.058		0.271	
Dismissed/unresolved	359	0.056		219	0.068		0.533	
Months in bankruptcy	344	12.494	9.133	212	12.017	8.783	0.678	0.436

NOTE.—The firm and case characteristics are for 359 Chapter 11 firms with DIP financing and 219 Chapter 11 firms without. The Chapter 11 cases are retrieved from the UCLA–LoPucki Bankruptcy Research Database over the period 2002–2019. Variable definitions are in Appendix Table A1.

[a] p-values from a t-test of the difference in the mean and a rank-sum test of the difference in the median are presented in the last two columns.

Table 2: Summary statistics for 362 DIP-loan packages issued to 359 Chapter 11 firms, 2002–2019

Variable	N	Mean	SD	25th	Median	75th
A: Package size						
Package amount	362	365.975	1,855.408	40.000	94.745	250.000
Package amount/assets	362	0.152	0.150	0.048	0.105	0.206
B: Loan type						
Multiple facility	362	0.412	0.493	0	0	1
Revolver	362	0.829	0.377	1	1	1
Term loan	362	0.478	0.500	0	0	1
C: Loan maturity						
Maturity	336	9.669	6.247	6	8	12
Maturity tied to plan confirmation or asset sale	362	0.707	0.456	0	1	1
D: Seniority						
Super-priority	361	1.000	0.000	1	1	1
First/second lien	361	0.994	0.074	1	1	1
Priming lien	361	0.817	0.387	1	1	1
E: Roll-up						
Roll-up	362	0.282	0.450	0	0	1
Roll-up amount	86	170.516	364.931	30	86	190
Roll-up amount/DIP amount	86	0.497	0.227	0.320	0.500	0.667
F: Use of proceeds						
UoP-Working capital	357	0.980	0.139	1	1	1
UoP-Prepetition	357	0.602	0.490	0	1	1
UoP-Postpetition	357	0.625	0.485	0	1	1
G: Covenants						
Affirmative or negative covenants	341	0.988	0.108	1	1	1
Financial covenants	336	0.869	0.338	1	1	1
Liquidity/cash level	336	0.595	0.492	0	1	1
EBITDA level	336	0.551	0.498	0	1	1
Debt/EBITDA or leverage ratio	336	0.220	0.415	0	0	0
Coverage ratio	335	0.122	0.328	0	0	0
Capex or production	336	0.542	0.499	0	1	1
Governance and management	336	0.122	0.328	0	0	0
Plan confirmation	335	0.113	0.318	0	0	0
H: Mandatory prepayment						
Prepayment sweep	347	0.513	0.501	0	1	1
Asset sale sweep	347	0.504	0.501	0	1	1
Debt issuance sweep	347	0.262	0.440	0	0	1
Extra cash sweep	347	0.058	0.233	0	0	0
I: Milestones and events of default						
Any milestones and events of default	340	0.997	0.054	1	1	1
Chapter 7 conversion or case dismissal	340	0.944	0.230	1	1	1
Appointment of trustee or examiner	340	0.838	0.369	1	1	1
Loss of automatic stay or exclusivity	340	0.744	0.437	0	1	1
Change of control	340	0.712	0.454	0	1	1
Plan and disclosure statement filing and approval timeline	340	0.659	0.475	0	1	1
§363 bidding procedure and sale approval	340	0.185	0.389	0	0	0
Appointment of key personnel	340	0.176	0.382	0	0	0

Table 3: Comparing DIP-loan packages to industry- and size-matched investment-grade and leveraged loans

	DIP loan packages (1) Mean	Industry/size **matched** investment-grade loans (2) Mean	Industry/size **matched** leveraged loans (3) Mean	Loans within three years before Chapter 11 (4) Mean	Loans within one year before Chapter 11 (5) Mean	Diff (1) - (2) p-value[a]	Diff (1) - (3) p-value[a]	Diff (1) - (4) p-value[a]	Diff (1) - (5) p-value[a]
A: Firm characteristics									
Assets	3,575	3,615	3,271	10,004	8,248	0.960	0.691	0.004	0.004
ROA	0.024	0.151	0.098	0.080	0.054	0.000	0.000	0.000	0.240
Leverage	1.064	0.542	0.753	0.858	0.920	0.000	0.000	0.000	0.029
Cash	0.054	0.107	0.095	0.053	0.058	0.000	0.000	0.814	0.642
Tangibility	0.393	0.340	0.346	0.400	0.435	0.010	0.020	0.735	0.240
Industry distress	0.208	0.000	0.075	0.060	0.088	0.002	0.000	0.000	0.021
N	359	359	359	302	68				
B: Package characteristics									
Package amount	365.975	578.519	429.970	567.328	558.087	0.128	0.526	0.066	0.370
Package amount/assets	0.152	0.329	0.294	0.207	0.151	0.000	0.000	0.015	0.975
Revolver	0.829	0.859	0.762	0.723	0.713	0.255	0.022	0.000	0.014
Term loan	0.478	0.245	0.512	0.523	0.494	0.000	0.343	0.217	0.785
Maturity	9.669	45.558	49.592	45.665	39.661	0.000	0.000	0.000	0.000
Financial covenants	0.869	0.535	0.538	0.553	0.540	0.000	0.000	0.000	0.000
Liquidity/cash level	0.595	0.039	0.046	0.043	0.023	0.000	0.000	0.000	0.000
EBITDA level	0.551	0.016	0.077	0.127	0.195	0.000	0.000	0.000	0.000
Debt/EBITDA or leverage ratio	0.220	0.499	0.416	0.388	0.287	0.000	0.000	0.000	0.188
Coverage ratio	0.122	0.423	0.406	0.398	0.356	0.000	0.000	0.008	0.000
Capex or production	0.542	0.078	0.204	0.269	0.253	0.000	0.000	0.000	0.000
Prepayment sweep	0.513	0.084	0.358	0.416	0.460	0.000	0.000	0.000	0.376
Asset sale sweep	0.504	0.076	0.349	0.398	0.448	0.000	0.000	0.004	0.351
Debt issuance sweep	0.262	0.052	0.269	0.266	0.264	0.000	0.828	0.896	0.968
Extra cash sweep	0.058	0.018	0.159	0.155	0.161	0.005	0.000	0.000	0.001
N	362	383	416	394	87				

NOTE.—The industry- and size-matched investment-grade and leveraged-loan packages, and loan packages issued to the same bankrupt firms within the three-year period or one-year period prior to Chapter 11 filing, are from Dealscan. To determine industry- and size-matched borrowers, we find a non-bankrupt investment-grade (leveraged) loan issuer in the year of bankruptcy filing that is in the same FamaFrench 12-industry and has the closest book assets to Chapter 11 firms. Panel A compares firm characteristics of the five sets of loan issuers. Panel B compares key characteristics of the 362 DIP-loan packages in our sample with those of loans issued to the industry- and size-matched investment-grade and leveraged-loan issuers and loans to the same bankrupt firms prior to Chapter 11 filing. Variable definitions are in Appendix Table A1.

[a] p-values from a t-test for the difference in means.

Table 4: **Summary statistics of 545 DIP-loan facilities (within 362 loan packages) issued to 359 Chapter 11 firms, 2002–2019**[a]

	N	Mean	SD	Min	25th	Median	75th	Max
A: Facility characteristics								
Revolver	545	0.635	0.482	0	0	1	1	1
Term loan	545	0.365	0.482	0	0	0	1	1
Facility amount	543	244.008	1480.215	0.700	30.000	75.000	175.000	33300.000
Facility amount/assets	543	0.101	0.103	0.000	0.031	0.071	0.133	0.747
Maturity	517	10.121	6.331	1.000	6.000	9.000	12.000	36.000
First/second lien	543	0.993	0.086	0.000	1.000	1.000	1.000	1.000
B: Interest and fee								
LIBOR spread	522	627.891	316.112	6.400	350.000	586.550	850.000	1845.800
Fixed rate	75	1033.533	381.977	350.000	800.000	1100.000	1200.000	2000.000
AISD	522	658.208	322.978	6.400	385.000	605.000	892.300	1845.800
Upfront fee	496	104.289	165.645	0.000	0.000	25.000	175.000	1904.762
Annual fee	496	35.028	97.788	0.000	0.000	0.000	0.000	850.000
Commitment fee	496	83.000	130.954	0.000	0.000	50.000	100.000	1000.000
Extension fee	496	6.331	28.670	0.000	0.000	0.000	0.000	250.000
Exit fee	496	59.769	145.640	0.000	0.000	0.000	32.083	1350.000
Default fee	491	218.788	89.283	0.000	200.000	200.000	200.000	1200.000

[a] Variable definitions are in Appendix Table A1.

Table 5: Comparing DIP-loan facilities to industry- and size-matched investment-grade and leveraged loan facilities

	DIP loan facilities (1) Mean	Industry/size matched investment-grade loans (2) Mean	Industry/size matched leveraged loans (3) Mean	Loans within three years before Chapter 11 (4) Mean	Loans within one year before Chapter 11 (5) Mean	Diff (1) - (2) p-value[a]	Diff (1) - (3) p-value[a]	Diff (1) - (4) p-value[a]	Diff (1) - (5) p-value[a]
A: Facility characteristics									
Revolver	0.635	0.785	0.552	0.548	0.562	0.004	0.000	0.003	0.008
Term loan	0.365	0.215	0.448	0.452	0.438	0.004	0.000	0.003	0.006
Facility amount	244.008	442.567	288.496	377.828	400.290	0.480	0.055	0.060	0.366
Facility amount/assets	0.101	0.210	0.198	0.129	0.105	0.000	0.000	0.001	0.339
Maturity	10.121	45.407	50.694	48.116	40.942	0.000	0.000	0.000	0.000
First/second lien	0.993	0.310	0.789	0.770	0.860	0.000	0.000	0.000	0.000
B: Interest and fee									
LIBOR spread	627.891	136.124	332.684	354.622	457.223	0.000	0.000	0.000	0.000
AISD	658.208	138.128	340.805	365.894	457.946	0.000	0.000	0.000	0.000
Upfront fee	104.289	14.684	50.864	46.387	30.396	0.000	0.000	0.000	0.000
Annual fee	35.028	6.441	5.694	3.041	0.962	0.000	0.000	0.000	0.000
Commitment fee	83.000	16.507	30.880	29.222	36.136	0.000	0.000	0.000	0.001
Extension fee	6.331	0.532	1.460	0.863	0.137	0.002	0.001	0.000	0.047
Exit fee	59.769	2.660	26.357	53.522	79.121	0.000	0.000	0.491	0.369
Default fee	218.788	206.992	217.059	211.773	215.244	0.758	0.055	0.160	0.634
N	545	452	620	575	121				

NOTE.—The 545 DIP-loan facilities are compared to industry- and size-matched investment-grade and leveraged-loan facilities issued to the bankrupt firms, and within the three-year period or one-year period prior to Chapter 11 filing. Variable definitions are provided in Appendix Table A1.

[a] p-values for a t-test of the difference in means.

Table 6: Summary statistics for the DIP-loan solicitation process at the loan package level

Sample (variable definitions in Appendix Table A1)	N	Mean	SD	25th	Median	75th
Sample reporting that prospective lenders were approached	253 of 362	0.699	0.459	0	1	1
Sample reporting the actual number of lenders approached	136 of 253	17.728	20.115	8	12	20
Sample reporting the number of lenders interested	184 of 253	4.467	7.572	1	3	5
Sample reporting a formal round of bidding for the DIP loan	32 of 362	0.088	0.284	0	0	0

Table 7: DIP-loan solicitation and loan spreads

	LIBOR spread (1) Full sample	AISD (2) Full sample	LIBOR spread (3) Cond. sample	AISD (4) Cond. sample	LIBOR spread (5) Cond. sample	AISD (6) Cond. sample
Prospetive lenders approached	36.418	42.01				
	[35.960]	[36.427]				
Above-median number of approached lenders			75.36	70.103		
			[51.753]	[52.945]		
Above-median number of interested lenders					-151.992***	-151.973**
					[49.091]	[53.702]
Log(facility amount)	-46.158***	-50.276***	-48.230**	-59.299**	-66.996**	-76.260***
	[9.720]	[10.528]	[22.717]	[21.638]	[23.231]	[19.838]
Maturity	-5.261	-4.353	4.516	5.972	-2.482	0.079
	[3.449]	[3.381]	[7.413]	[7.511]	[3.537]	[3.667]
Financial covenants	-9.179	6.854	12.119	31.389	-48.278	-42.456
	[51.707]	[49.840]	[144.233]	[143.167]	[112.082]	[112.956]
Prepayment sweep	26.77	41.001	-55.703	-28.642	-5.68	-0.905
	[29.046]	[31.359]	[52.064]	[51.964]	[60.008]	[65.110]
Size	-13.709	-21.204	-21.01	-22.55	-11.896	-16.492
	[11.879]	[13.730]	[20.189]	[19.758]	[23.219]	[21.876]
ROA	-74.222	-53.869	8.879	35.802	-50.244	-16.343
	[93.722]	[100.171]	[66.264]	[57.446]	[131.949]	[119.066]
Leverage	-66.293***	-62.248**	-154.703***	-149.384***	-25.346	-13.806
	[20.522]	[22.008]	[31.422]	[33.409]	[31.983]	[34.852]
Cash	201.302	189.235	248.956	259.286	79.455	85.805
	[235.374]	[250.462]	[291.125]	[299.408]	[269.393]	[283.023]
Tangibility	-23.268	-17.644	-96.458	-75.797	9.696	29.096
	[77.375]	[87.679]	[114.478]	[119.690]	[89.569]	[93.473]
Industry distress	-11.841	7.833	-43.108	-37.78	-43.674	-36.796
	[51.543]	[58.122]	[76.800]	[77.602]	[54.552]	[56.072]
Prepack	-32.939	-36.898	-54.211	-43.577	-77.785*	-74.098*
	[32.569]	[34.439]	[51.445]	[49.959]	[39.621]	[35.748]
FF-12, year, and loan type FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	429	429	174	174	242	242
Adjusted R^2	0.365	0.315	0.445	0.417	0.443	0.417

NOTE.—This table regresses DIP-loan spreads at the facility level on different measures of loan search and solicitation, with LIBOR spread as the dependent variable in columns (1), (3), and (5), and AISD in columns (2), (4), and (6). Columns (3)-(4) employ a sample of debtors who provide the number of lenders approached. Columns (5)-(6) employ a sample of debtors who provide the number of lenders interested. Above-median number of lenders approached is an indicator variable that takes the value of one if the number of lenders approached is above the median of 12, and zero otherwise. Above-median number of lenders interested is an indicator variable that takes the value of one if the number of lenders interested is above the median of three, and zero otherwise. All regressions include FamaFrench12-industry fixed effects, year fixed effects, and loan type fixed effects. Robust standard errors clustered at the year level are in brackets. Variable definitions are in Appendix Table A1.
* p<.10
** p<.05
*** p<.01

Table 8: Determinants of the likelihood that prepetition secured lenders provide DIP loans

Regression variables	Coefficient estimates
Size	0.002
	[0.129]
ROA	-0.16
	[1.039]
Leverage	-0.09
	[0.353]
Cash	-6.491**
	[2.861]
Tangibility	-0.303
	[0.765]
Industry distress	0.224
	[0.472]
Prepack	0.734**
	[0.360]
Bank loan/assets	1.416**
	[0.686]
FF-12 and year fixed effects	Yes
N	312
Pseudo R^2	0.167

NOTE.—The DIP financing is at the loan package level, using a logit regression. Robust standard errors clustered at the year level are in brackets. Variable definitions are in Appendix Table A1.
** p<.05

Table 9: Relationship lending and DIP-loan spreads

	LIBOR spread (1)	AISD (2)	LIBOR spread (3)	AISD (4)	LIBOR spread (5)	AISD (6)
DPrior	-60.865	-51.757				
	[40.735]	[42.185]				
Relationship lender(number)			-88.550*	-81.965*		
			[46.259]	[45.536]		
Relationship lender(amount)					-101.479**	-96.842**
					[45.350]	[45.202]
Log(facility amount)	-56.207***	-60.788***	-55.950***	-60.489***	-56.281***	-60.774***
	[15.281]	[15.316]	[15.111]	[15.323]	[14.976]	[15.160]
Maturity	-2.182	-1.664	-2.07	-1.535	-2.087	-1.538
	[4.526]	[4.698]	[4.435]	[4.611]	[4.397]	[4.567]
Financial covenants	17.66	27.992	16.366	27.66	20.305	31.711
	[59.113]	[59.505]	[57.116]	[56.841]	[56.994]	[56.734]
Prepayment sweep	73.122*	80.092*	77.161**	84.010**	78.583**	85.552**
	[37.917]	[38.601]	[36.544]	[37.264]	[37.153]	[37.944]
Size	1.551	-5.457	2.598	-4.216	4.038	-2.708
	[12.992]	[14.886]	[12.955]	[14.384]	[12.807]	[14.114]
ROA	-37.285	-7.816	-30.401	-1.383	-31.924	-2.616
	[76.496]	[82.105]	[74.378]	[79.385]	[74.348]	[79.293]
Leverage	-39.083	-38.469	-38.288	-37.194	-35.99	-34.773
	[22.685]	[24.534]	[22.378]	[24.616]	[22.130]	[24.140]
Cash	211.553	210.371	199.057	195.218	178.952	174.308
	[249.081]	[247.896]	[254.030]	[254.921]	[259.761]	[259.844]
Tangibility	-79.779	-83.177	-95.542	-99.058	-102.608	-106.744
	[85.632]	[101.659]	[82.466]	[99.777]	[82.294]	[99.063]
Industry distress	-18.432	9.192	-18.264	9.844	-18.633	9.686
	[64.032]	[69.033]	[60.508]	[65.587]	[59.368]	[64.219]
Prepack	-62.184	-71.227	-65.176*	-74.159*	-67.090*	-76.133*
	[36.848]	[42.067]	[36.436]	[42.110]	[36.800]	[42.406]
FF-12, year, and loan type FE	Yes	Yes	Yes	Yes	Yes	Yes
N	349	349	349	349	349	349
Adjusted R^2	0.390	0.344	0.396	0.349	0.400	0.354

NOTE.—This table regresses DIP-loan spreads on variables indicating the degree of relationship lending. The sample comprises 349 DIP loans provided by prepetition secured lenders over the period 2002–2019. The regressions are run at the facility level, with LIBOR spread as the dependent variable in columns (1), (3), and (5), and AISD in columns (2), (4), and (6). All regressions include FF12-industry fixed effects, year fixed effects, and loan type fixed effects. Robust standard errors clustered at the year level are in brackets. Variable definitions are provided in Appendix Table A1.

* p<.10

** p<.05

*** p<.01

Appendix Table A 1: **Variable definitions**

Variable name	Definition
A: Firm characteristics	
Assets	Book assets measured in millions of dollars as of the last fiscal year before Chapter 11 filing
Size	Log (assets)
ROA	EBITDA/assets
Leverage	Liabilities/assets
Cash	Cash and short-term investments/assets
Tangibility	net PP&E/assets
Industry distress	Indicates whether industry median sales growth (based on two-digit SIC industry code) is below −5%
Bank loan/assets	Amount of outstanding bank loans at the time of bankruptcy filing scaled by book assets
B: Chapter 11 characteristics	
Delaware	Indicates whether case is filed in Delaware
NYSD	Indicates whether case is filed in Southern District of New York
Prepack	Indicates whether case is prepackaged
Emergence	Indicates emerged from Chapter 11
Liquidation/conversion	Indicates Chapter 11 liquidation or Chapter 7 conversion
Acquisition	Indicates whether Chapter 11 firm is sold as a whole
Dismissed/unresolved	Indicates whether case is dismissed or unresolved as of May 2020
Months in bankruptcy	Number of months from date of filing to date of plan confirmation
C: Package size	
DIP amount	Amount of DIP loan package in millions of dollars approved in the final order
DIP amount/assets	Amount of DIP loan package approved in the final order scaled by book assets
DIP amount/liabilities	Amount of DIP loan package approved in the final order scaled by book liabilities
D: Facility type	
Multiple facility	Indicates whether DIP loan package includes multiple facilities
Revolver	Indicates whether revolver facility (including Letter of Credit) is included in the package
Term loan	Indicates whether term loan facility is included in the package
E: Loan maturity	
Maturity	Maturity in number of months
Maturity tied to plan confirmation or asset sale	Indicates whether DIP loan matures upon plan confirmation or sale of substantially all assets through Section 363
F: Seniority	
Super-priority	Indicates whether DIP loan carries super-priority (Section 364c(1))
First/second lien	Indicates whether DIP loan is given first lien on unencumbered collateral or junior lien on encumbered assets (Section 364c(2) & 364c(3))
Priming lien	Indicates whether DIP loan has a first lien on encumbered assets (Section 364d)
G: Roll-up	
Roll-up	Indicates whether DIP loan package includes at least one roll-up facility. Roll-ups allow DIP lenders to convert all or a portion of their existing prepetition secured debt into DIP loans

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Variable name	Definition
Roll-up amount	Amount of roll-up facility in millions of dollars
Roll-up amount/DIP amount	Amount of roll-up facility scaled by DIP amount
H: Use of proceeds	
UoP–Working capital	Indicates whether DIP is used to support working capital
UoP–Prepetition	Indicates whether use of proceeds includes paying prepetition debt (interest or principal), expenses that occurred before filing (e.g. property tax, employee wages, etc.), and other types of payment such as repurchase of receivables sold to third parties
UoP–Postpetition	Indicates whether use of proceeds includes paying postpetition debt expenses, professional fees, and other bankruptcy related expenses
I: Covenants	
Affirmative or negative covenants	Indicates whether DIP loan has affirmative or negative covenants
Financial covenants	Indicates whether DIP loan has financial covenants
Liquidity/cash level	Indicates whether DIP loan has covenants tied to liquidity/cash condition
EBITDA level	Indicates whether DIP loan has financial covenants tied to EBITDA level
Debt/EBITDA or leverage ratio	Indicates whether DIP loan has financial covenants tied to Debt/EBITDA or leverage ratio
Coverage ratio	Indicates whether DIP loan has financial covenants tied to interest coverage
Capex or production	Indicates whether DIP loan has covenants tied to Capex or production level
Plan confirmation	Indicates whether DIP loan has covenants tied to plan confirmation
Governance or management	Indicates whether DIP loan has covenants tied to governance or management
J: Mandatory prepayment	
Prepayment sweep	Indicates whether prepayment is required if there is asset sale, new debt issuance, or extra cash on balance sheet
Asset sale sweep	Indicates whether prepayment is required if there is asset sale
Debt issuance sweep	Indicates whether prepayment is required if there is new debt issuance
Extra cash sweep	Indicates whether prepayment is required if there is extra cash on balance sheet
K: Milestones and events of default	
Milestones and events of default	Indicates whether any milestone or event of default is specified in the DIP loan credit agreement
Chapter 7 conversion or case dismissal	Indicates whether it is an event of default when case is converted to Chapter 7 or dismissed
Appointment of trustee or examiner	Indicates whether it is an event of default to have a trustee or examiner appointed by court
Loss of automatic stay or exclusivity	Indicates whether it is an event of default to have automatic stay lifted or lose exclusivity of filing a plan
Change of control	Indicates whether it is an event of default when there is a change of control (except for change by plan)
Plan and disclosure statement filing and approval	Indicates whether debtor is required to have plan and disclosure statement filed and approved by certain date
Appointment of key personnel	Indicates whether DIP contract requires debtor to hire specific key personnel such as chief restructuring officers
§363 bidding procedure and sale approval	Indicates whether debtor is required to have order approving the bidding procedure for a sale of substantially all of its assets and order approving the sale entered by certain dates
M: Facility size	
Facility amount	Amount of DIP-loan facility in millions of dollars
Facility amount/assets	Amount of DIP-loan facility scaled by book assets

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Variable name	Definition
N: Interest and fee	
LIBOR spread	Interest charged on a facility as a spread over the London Interbank Offered Rate (LIBOR) in basis points. When interest is expressed as a spread over a different reference rate other than LIBOR such as U.S. prime rate or federal funds rate, the spread is converted to LIBOR spread using the difference between the three-month LIBOR rate and the quoted reference rate in the month of final approval of DIP financing
Fixed rate	Fixed rate charged on a facility, reported for those facilities whose interest rates are quoted as a fixed rate
AISD	All-in spread drawn, measured as the sum of LIBOR spread and annual fee. We use LIBOR spread for 45 facilities that have missing annual fee.
Upfront fee	Fee charged upon closing of a loan in basis points. Upfront fee can include various components such as closing fee, underwriting fee, arranger fee, agent fee, issue discount, etc. Following Dealscan definition and practice, if an upfront fee is assessed for a multi-facility package, then the fee is expressed on each part of the package as a fee on the percentage of borrowings allowed. However, if an upfront fee is charged on the entire amount available, we put the fee only on revolving credit (not on term loan)
Annual fee	Annual charge against entire commitment amount of a facility, whether used or unused
Commitment fee	Fee charged on commitment amount of a facility that is unused
Extension fee	Fee charged for extending maturity of a facility
Exit fee	Fee charged on facility exit or early termination of a facility
Default fee	Fee charged upon default on a facility, defined in the "Events of Default" section of credit agreement
O: DIP-loan bidding	
Prospective lenders approached	Indicates whether debtor has solicited or surveyed interests of prospective lenders in providing DIP financing as documented in its motion
Number of lenders approached	Number of lenders whom debtor has approached, conditional on it approaching prospective lenders
Number of lenders interested	Number of lenders who have shown interest in providing DIP financing, conditional on debtor approaching prospective lenders
Bidding on DIP loans	Indicates whether debtor holds a formal bidding process after receiving interests from multiple lenders
L: Lender type and relationship lending	
Prepetition secured	Indicates whether DIP financing is provided by prepetition secured lenders
Dprior	Indicates whether DIP financing is provided by lenders who have prepetition lending relationships with debtor (i.e., DIP lenders provide at least one loan over the five-year period preceding Chapter 11 filing)
Relationship lender(number)	Strength of the lending relationship based on the number of loans provided to debtor over the five-year period preceding Chapter 11 filing (i.e., the number of loans provided by DIP lenders scaled by the total number of loans taken out by debtor in the last five years)
Relationship lender(amount)	Strength of the lending relationship based on the amount of loans provided to debtor over the five-year period preceding Chapter 11 filing (i.e., the amount of loans provided by DIP lenders scaled by the total amount of loans taken out by debtor in the last five years)

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