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Debtor-in-possession financing and bankruptcy resolution: Empirical evidence [☆]

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Abstract

Debtor-in-possession (DIP) financing is unique secured financing available to firms filing for Chapter 11. Opponents of DIP financing argue that it leads to overinvestment. Alternatively, DIP financing can allow funding for positive net present value projects that increase the likelihood of reorganization and reduce time in bankruptcy. Using a large sample of bankruptcy filings, we find little evidence of systematic overinvestment. DIP financed firms are more likely to emerge from Chapter 11 than non-DIP financed firms. DIP financed firms have a shorter reorganization period; they are quicker to emerge and also

quicker to liquidate. The reorganization period is even shorter when prior lenders provide the DIP financing.

Introduction

Under the US Bankruptcy Code ("Code"), a company that files for protection under Chapter 11 is frequently referred to as debtor-in-possession (DIP). The filing enables a financially distressed firm to restructure its financial and operational base. However, given the repayment uncertainties created by such a filing, few lenders are willing to extend the additional loans usually needed for a successful reorganization. The Code (under Section 364) addresses these lending disincentives by providing special creditor rights to post-petition loans. These loans are usually referred to as DIP financing, and the lender providing such financing can get superior seniority and enhanced security that is not available outside the bankruptcy context. Further, DIP loans have to be completely paid off before the borrower can emerge from Chapter 11.

Although DIP financing has been available since the 1978 Bankruptcy Reform Act, it was not until the wave of bankruptcies in the early 1990s that DIP financing grew in size and importance. DIP financing has come to play an increasing role in the reorganization process of financially distressed firms, yet little work has examined it in detail.

A large and growing debate in the law and economics literature centers on the drawbacks and merits of senior and secured financing in general and on DIP financing in particular. On the negative side, arguments against secured financing, such as DIP loans, note that such credit provides incentives for managers to undertake risky, possibly negative net present value (NPV) projects (the over-investment problem).[1] Bebchuk and Fried (1996) and Warren (1996) highlight ways in which pledging of assets to new secured lenders can lead to a transfer of wealth from existing unsecured creditors to new secured creditors, particularly when firms are in distress. On the positive side, Stulz and Johnson (1985) and Schwartz (1997) point out the merits of secured financing as it allows the borrower to undertake positive NPV projects that might be passed up in the absence of senior and secured credit such as DIP financing.

A related question is whether DIP financing prolongs the reorganization process or whether it facilitates a faster conclusion of the bankruptcy legal process. The

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[1] The risk-shifting incentives are analyzed in detail by Jensen and Meckling (1976). White (1994) provides an overview of the secured credit debate. Kanda and Levmore (1994) discuss the risk shifting caused by secured borrowing in general, and Gertner and Scharfstein (1991) and Triantis (1993) discuss the investment incentives to overinvest created by DIP financing in particular.

length of the process can be important because it can affect the eventual outcome (emergence from bankruptcy or liquidation) as well as the value of the firm's assets.

The final outcome and the length of the reorganization process may in turn depend on whether DIP financing is provided by an existing lender or by a lender with no previous outstanding loans. The information benefits enjoyed by a lender with prior claims can affect both the likelihood of a firm emerging from Chapter 11 and its time spent in bankruptcy.

We address the following specific questions empirically: What distinguishes firms that obtain DIP financing from firms that do not? How is DIP financing related to the probability and speed of bankruptcy resolution? Does it make a difference if the DIP financier is an existing creditor with a prior lending relationship with the firm? To the best of our knowledge, ours is the first empirical investigation of these issues.[2]

To answer these questions we gather a large and comprehensive sample of more than five hundred firms that filed for Chapter 11, together with the details of any DIP financing that they obtained. Our results show that larger firms are more likely to obtain DIP financing. This result seems intuitive given that DIP financiers receive superpriority on the underlying assets. We also find that firms obtaining DIP financing are more likely to emerge from the Chapter 11 process than firms that do not. These results are consistent with DIP lenders having an information role, playing a screening role in which they are able to identify distressed firms that are strong and likely to emerge quickly, as well as a monitoring role in which the DIP lenders help firms to emerge quickly.

Firms that receive DIP financing take a shorter time to resolve their Chapter 11 filing. This applies both to reorganizations leading to eventual emergence from Chapter 11 and to those leading to liquidations. The shortened time to liquidations, in particular, is consistent with an information-related monitoring role, rather than a pure screening role, for DIP lenders. It suggests that DIP lenders finance positive NPV projects and help the company emerge from bankruptcy, but if things do not go well with the firm then they are quick to liquidate to preserve the value of the underlying assets.

We examine the identity of the DIP lenders (whether insiders with prior lending relationships or outsiders) and how their identity affects the time in bankruptcy and resolution outcome.[3] While many firms receive DIP financing from an existing

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[2] Related work on DIP financing includes Carapeto (1999), Chatterjee et al. (1997), and John et al. (2000). Carapeto studies the impact of DIP financing on recovery rates. Chatterjee, Dhillon, and Ramírez examine the impact of DIP financing announcement in the borrower's market value and report a positive excess return for both equity and bondholders around the date of DIP loan announcement suggesting DIP financing reveals positive information. John, John, and Vasudevan present a theoretical analysis where DIP financing has a screening effect, improving the probability of successful reorganization. They also predict that announcements of DIP financing by firms in Chapter 11 should lead to positive price effects for both equity and debt (see also, Dhillon et al., 1995). This information effect could also relate to the DIP financiers monitoring capability as discussed below.

[3] Gilson (1990) and Gilson et al. (1990) document the active role played by bank lenders in a firm's reorganization process.

lender, a significant number obtain it from a lender with whom they have no existing lending relationship. An existing (insider) lender would have some prior claims outstanding when it decides to offer DIP financing. An insider lender is also likely to have better private information about its borrower's future prospects compared with a new (outsider) lender. We use these two features of inside DIP financing to conduct further tests. We find that insiders are more likely to provide DIP financing to smaller firms. Furthermore, inside DIP financing is related to faster resolution of the Chapter 11 process, for both emergence and liquidation outcomes. Our results are consistent with a screening and monitoring role for inside DIP financiers wherein they invest in companies with positive NPV projects and help them to emerge quickly. If the firm does not do well, then insiders are quicker to liquidate the borrower than outsiders. One possible explanation for these results is that inside lenders have more at stake than their DIP loans alone. Inside lenders, because they enjoy a comparative informational advantage regarding the prospects of the firm and the added incentive to protect their preexisting debt, have an enhanced incentive to bring the Chapter 11 process to a close, one way or the other, as quickly as possible.

The paper is organized as follows: In Section 2 we briefly describe the DIP financing process and features of this form of financing. Section 3 describes the testable hypotheses. Section 4 provides the details of the data and sample selection. The main results, their interpretations, and robustness checks are contained in Section 5. Section 5 sums up our conclusions.

2. The DIP financing process

Although the existing management of a firm filing for Chapter 11 frequently retains control over the business operations and the reorganization process, major decisions (including the decision to obtain DIP financing) require prior approval by the bankruptcy court.[4] The DIP financing approval process usually involves two steps.

In the first step (assuming the debtor already has a lender willing to provide DIP financing), the debtor makes a motion for authorization to obtain credit [pursuant to Federal Bankruptcy Rule 4001 (c)(1)]. This motion is usually filed either simultaneously with the Chapter 11 filing or shortly thereafter. (For our sample, over 60% of the firms obtain DIP financing within 30 days of filing for Chapter 11.) The court does not commence a final hearing on the motion for at least a 15-day period, during which other existing creditors of the firm can respond to this motion. However, most motions contain a request for an interim hearing. This hearing authorizes immediate borrowing of a limited amount "only to the extent necessary to avoid immediate and irreparable harm to the estate pending a final hearing" [the

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[4]This section draws heavily on Kohn et al. (1995) and Rosen et al. (1998).

Federal Bankruptcy Rule 4001 (c)(2)]. Thus, in most cases, the debtor is able to get a limited amount of DIP funding right away.

In the second step in the process to obtain DIP financing, a permanent or final financing order is entered by the court, which authorizes the borrowing of the full amount of the lender's commitment. This occurs after the court has heard arguments from other creditors who may object to such financing. These arguments can affect the final size and terms of the approved DIP financing.

DIP financing is governed by section 364, which has four subsections. Subsections (a) through (d) provide an increasing level of priority and security for the DIP lender. While no court approval is needed for financing under 364(a), it is needed for financing under 364(b). The main implication of this is that financing under 364(a) is more likely to be challenged by other creditors. In both cases the credit is unsecured, but within the class of unsecured loans it has the first priority along with other administrative claims such as professional fees and costs of administering the estate of the firm. In most cases this level of security is not enough to induce lenders to provide new loans (see, e.g., Moore, 1990).

Financing under 364(c) or 364(d) provides better security and also requires prior court approval. Under subsection 364(c) the court may authorize DIP credit with a superpriority status. For example, the loans under this section may enjoy priority over administrative expenses and a lien on unencumbered assets or a junior lien on encumbered assets or both. Thus the financing under this subsection enjoys higher seniority as well as enhanced security. Subsection 364(d) provides the highest level of security for DIP financing as it is secured by a senior or equal lien on the assets that are already subject to a lien. Such a lien is referred to as a priming lien and is approved only after stringent conditions are met.[5] The majority of DIP financing is under subsection 364(c) or 364(d). We were able to obtain priority structure for a subsample of 26 DIP loans. All of these loans (including those by made by inside lenders) were under either subsection 364(c) or 364(d). This suggests that, in practice, DIP financing typically enjoys a high priority.

Even though the DIP loans enjoy enhanced security, the DIP lender still faces some risk of loss. If the Chapter 11 filing is converted to Chapter 7 and if the liquidation value realized is less than that of the DIP loan, then the DIP lender suffers a loss. Further, in such a case the administrative expenses of liquidating the firm rank above DIP loans. Also, in the event of liquidation, the DIP lender's superpriority status may apply only within the class of unsecured creditors. If the DIP loan is secured by inventory, pre-petition lenders and trade creditors can challenge the superpriority status of the DIP lender on the inventory claims.

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[5] These conditions are (1) inability of the debtor to obtain such credit otherwise and (2) adequate protection of the interest of the original holder of the lien; that is, the assets pledged to the existing secured lender have a value in excess of the value of the secured claim.

3. Data and sample selection

In assembling the sample of firms that obtained DIP financing we first use the *Bankruptcy DataSource* from New Generation Research Inc., which includes financial and reorganization information on major public firms that filed for Chapter 11. We identify all the firms that filed for Chapter 11 protection between January 1988 and December 1997, yielding a list of 685 filings (multiple filings by the same firm are treated as separate filings.) We then identify the industry of the debtors by checking its primary standard industrial classification (SIC) code as reported by *Bankruptcy DataSource*. When an SIC code is not available from *Bankruptcy DataSource*, we obtain it from Compustat. We exclude the financial services firms such as depository institutions, insurance companies, nonbanking financial firms, and real estate firms (SIC codes between 6000 and 6999). We also exclude the six Chapter 11 filings caused by asbestos and silicon implant litigation, as these were largely of a nonfinancial nature and the reorganization processes involved negotiation with a large number of tort claimants. This reduces the sample to 548 firms.

We then use a two-stage process to identify the subset of firms that obtained DIP financing. We first use the Dealscan database from Loan Pricing Corporation, which contains publicly available information on more than fifty thousand corporate loans booked since 1986. The database provides the name of the lead lender as well as the details of loans (purpose, size, maturity, etc.). The details on the purpose of the loan are contained under predefined data fields, including the field "Debtor-in-Possession." By searching under this field we generate a sample of loans meant primarily for debtor-in-possession financing. For the 10-year period of our study, we generate a primary sample of 166 cases in which DIP credit was obtained by 107 firms that filed for Chapter 11 in this period.[6]

However, the Dealscan database is not a complete and comprehensive source of all loans. We supplement this list by searching the Dow Jones News Retrieval system and the Lexis-Nexis business news section for the key words "Debtor-in-Possession financing," "DIP financing," and "post-petition financing" to flush out relevant stories. For robustness we also search the news stories for each firm around the date of its Chapter 11 filing and its Security and Exchange Commission (SEC) filings for any mention of DIP financing. This step allows us to confirm the accuracy of the Dealscan information and to find additional instances of DIP financing that are not included in the Dealscan database. We were able to confirm the Dealscan DIP financing for 93 of the 107 firms. This search also yields news stories of DIP financing for 58 firms that were not covered by the Dealscan database. Thus our final sample consists of 165 firms that received DIP financing. We found some indication of post-petition financing arrangements for an additional 10 firms but they were

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[6]The number of credit facilities is larger than the number of firms for two reasons. First, the DIP financing to a single borrower can consist of multiple facilities such as term loans and revolvers. Second, some of the firms renew their DIP facilities if the existing facilities mature before they are able to exit Chapter 11.

excluded from the sample because we could not confirm the information. This left us with a total sample of 538 Chapter 11 filings, of which 165 received DIP financing.

The data on the financial characteristics of the sample firms are for the last fiscal year before the year of bankruptcy filing. They are obtained primarily from Compustat, and, when not available, we used *Bankruptcy DataSource*, Disclosure, and 10 K filings. The dates of the Chapter 11 filing, plan confirmation, and emergence from Chapter 11, liquidation, or reorganization are taken from *Bankruptcy DataSource* and Lexis-Nexis. To estimate the time taken for the resolution of the reorganization process, we use the date of the confirmation of the plan by the bankruptcy court as the date of the final resolution of the reorganization process. However, a significant number of firms, mostly non-DIP, had no formal confirmation date as they either liquidated piecemeal via asset sales or were acquired outright. For these firms we use the date on which a significant asset sale or acquisition was approved by the bankruptcy court as the date of the resolution of the reorganization process.[7] In a few cases we are able to locate only the filing date for a liquidation plan with the bankruptcy court. If no other information was available, we used that date as the end point for the reorganization process. We also check the *Directory of Obsolete Securities* to find the final resolution of the Chapter 11 filing and augment our sample outcomes accordingly. The *Directory of Obsolete Securities* lists charter cancellations and firms that are dissolved or dismissed, which we treat as liquidations. Finally, for some firms we are unable to locate any resolution date.

To examine the role of the prior (pre-petition) lender in providing DIP financing, the identities of both the pre-petition and the DIP creditors are required. These are obtained primarily from the Dealscan database and were confirmed and supplemented through news stories and SEC filings. Of the 154 filings for which we were able to locate the DIP lender as well as the prepetition lender, 89 (58%) obtained DIP loans from their existing lenders.[8]

The calendar time distribution of firms filing for Chapter 11 and the subset that received DIP financing is illustrated in Table 1. There is a clustering of filings for the period 1990–1992, a period of recession for the US economy. Table 1 also reports the fraction of total filings that received DIP financing for each year, showing an increasing trend over the sample period. For the first half of the sample period, less than 20% percent of firms filing for Chapter 11 received DIP financing, while this proportion rises to over 30% for the later half of the sample period, reflecting the growing importance of the DIP market.

We further examine whether the time trend in DIP financing is a secular trend or if it reflects a change in the composition and characteristics of firms filing for Chapter 11. We examine a number of firm characteristics and find that over time those filing for Chapter 11 have smaller total assets as well as smaller current assets. This

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[7] The advantage of this approach is consistency across firms. The disadvantage is that if the resolution period extends beyond the first date of the asset sale we understate the resolution time. However, insofar as we are consistent in our approach across DIP and non-DIP financed firms, this is unlikely to bias our results in any manner.

[8] For the subsample for which we have data, the DIP loan amount to total assets ratio is 20.11% for inside DIP financed firms and 20.60% for outside DIP financed firms

Table 1

Calendar time distribution of date of chapter 11 filing. The sample consists of 538 nonfinancial companies filing for Chapter 11 between January 1, 1988 and December 31, 1997. The year of the filing is shown for 147 filings that were able to obtain debtor-in-possession (DIP) financing and 407 other filings that did not receive DIP financing.

Year	Total filings	Firms obtained DIP financing	Firms not obtaining DIP financing	Percentage of total filing receiving DIP financing
1988	27	2	25	7.41
1989	48	5	43	10.42
1990	58	16	42	27.59
1991	82	22	60	26.83
1992	64	16	48	25.00
1993	54	17	37	31.48
1994	47	14	33	29.79
1995	50	24	26	48.00
1996	56	27	29	48.21
1997	52	22	30	42.31
Total	538	165	373	30.67

suggests that it is important to control for such changes in firm characteristics over time when conducting our tests.

4. Methodology and results

In what follows we examine the characteristics of DIP financed firms and the relationship between DIP financing and the probability and speed of emergence from bankruptcy.

4.1. Characteristics of firms obtaining DIP financing

We first investigate which characteristics are related to a firm's ability to obtain DIP financing, after controlling for other factors. Table 2 gives univariate tests for the differences in means and medians. The variables that we examine are the firm's total assets, its leverage (defined as ratio of total liabilities to total assets), ratio of its current assets to total assets, and whether or not its filing was a prepackaged bankruptcy. The univariate tests suggest that larger firms (with more assets) receive DIP financing more often than smaller firms. The univariate tests also indicate that firms obtaining DIP financing have, on average, relatively less leverage (liabilities/assets) and more current assets (current assets / assets) than those not obtaining such financing. These results seem reasonable because larger firms typically have better access to capital markets. Also, the higher level of current assets may imply that those firms which are working capital intensive are more likely to seek and get DIP

Table 2

Selected characteristics for the 538 nonfinancial firms filing for Chapter 11 between January 1988 and December 1997. The financial information is for the last fiscal year before the year of filing and is obtained from a variety of sources including Compustat and *Bankruptcy DataSource*. The resolution period is the period between the filing date and the date of resolution for the firm's Chapter 11 filing.

Financial characteristics (number of firms for which data were available)	Full sample	Received DIP financing (A)	No DIP financing (B)	t-statistic for difference of means (A)-(B) (z-statistic for Wilcoxon rank sum test for difference of medians)
Number of firms	538	165	373	
Prepackaged bankruptcy	71	26	45	1.17
($N = 538$; DIP = 165; No DIP = 373)				(1.17)
Total assets (millions of dollars)	300.05	638.85	150.68*	8.11***
($N = 536$; DIP = 164; No DIP = 372)	(77.6)	(246.88)	(44.45)	(11.34)***
Book value of liabilities/assets	0.916	0.834	0.952	−2.12**
($N = 508$; DIP = 155; No DIP = 353)	(0.82)	(0.80)	(0.83)	(−1.35)
Current assets/assets	0.487	0.511	0.476	1.599
($N = 519$; DIP = 157; No DIP = 362)	(0.488)	(0.510)	(0.483)	(1.492)

Note: DIP = debtor-in-possession. *Significant at 10%. **Significant at 5% ***Significant at 1%.

financing. Another possible explanation is a preference for current assets as collateral for DIP financing (see, e.g., Rohman, 1990; and Rizzi, 1991).

While the univariate tests are suggestive, it is useful to conduct a multivariate test. We estimate a Probit regression model of the following form:

$$DIP_i = f\,(LOGASSET_i,\ LEVERAGE_i,\ PREPAK_i,\ POST\ 1992_i,$$
$$RETAIL,\ CA/TA_i) \tag{1}$$

The variables are:

DIP—the dependent variable is equal to one if the firm i obtained DIP financing, zero otherwise,

LOGASSET—the natural log of the book value of total assets as reported for the last year before the date of filing for Chapter 11,

LEVERAGE—the ratio calculated by dividing the sum of the long-term debt and current liabilities by the total assets,[9]

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[9] We define the leverage ratio as the summation of long-term debt and current liabilities to total assets, instead of just the ratio of long-term debt to total assets. One reason for this is to take into account that, in some instances of default, Compustat records the long-term debt as zero and treats the long-term debt as current liabilities. Our measure of leverage mitigates the effect of any such recording bias by Compustat.2

PREPAK—a dummy variable that takes the value one if the filing was a prepackaged Chapter 11 filing, zero otherwise,

POST1992—a dummy variable that takes the value one if the Chapter 11 filing took place in the period 1992–1997, zero otherwise,

RETAIL—a dummy variable that takes the value one if the primary SIC code reported in the Chapter 11 filing is in the range 5200–5999,

CA/TA—the ratio of current assets to total assets of the firm.

In all cases the accounting data are for the last fiscal year before the year of the Chapter 11 filing. The impact of the size of the firm's assets on its likelihood to obtain DIP financing is measured by *LOGASSET*. Assuming that asset size proxies for available collateral, we would expect to find a positive coefficient for the *LOGASSET*. We conduct robustness checks using two other variables instead of total assets. We use current assets alone (as opposed to the ratio of current assets to total assets) as a measure of liquid collateral instead of total assets and find similar results. We also use Net Property, Plant, and Equipment (NPPE) as a proxy for size both in addition to and as a substitute for *LOGASSET*. We find that NPPE is not a significant determinant of DIP financing and hence do not include it in our regressions. The variable *LEVERAGE* captures the capital structure of the debtor. This variable could influence the firm's ability to obtain DIP financing, as a higher level of existing debt may hamper the firm's ability to obtain new debt. A prepackaged filing requires the firm to file a plan of reorganization that has been agreed to by all claim classes at the time of filing for Chapter 11. As reported by Tashijian, Lease, and McConnell (1996), a prepackaged filing leads to a significantly shorter stay in the reorganization process for the debtor. A debtor filing for a prepackaged reorganization plan is unlikely to require DIP financing because of a shorter anticipated stay in the reorganization process. We therefore expect to find a negative coefficient for the *PREPAK* variable (though some prepackaged filings do receive DIP financing).

We control for the historical growth of DIP financing by including the dummy variable *POST1992*. Because the DIP financing business has grown rapidly in the last few years, the debtor filing for Chapter 11 in the later half of the sample period is more likely to get DIP financing. The retail industry produced a relatively large fraction of high-profile DIP financing (Macy's, Federated, Ames, and Carter Hawley Hale Stores are some of the examples). Further, a large number of firms filing for bankruptcy arrange DIP financing to reassure trade creditors and customers of their continued access to liquid funds, which can be important in the retail industry. Rohman (1990) and Rizzi (1991) discuss the special attraction of retail firms to DIP lenders. Thus retailers have a tendency to have a higher demand for DIP financing. This is also reflected in the fact that over 25% of retail firms in Chapter 11 in our sample get DIP financing. Hence we include a dummy variable for the retail industry as a control in our model specification.

Results for the Probit model are reported in panel A of Table 3. The negative intercept shows that the typical firm does not emerge from Chapter 11. The results show that the larger firms are more likely to obtain DIP financing, as are retail firms,

Table 3

Characteristics of firms obtaining debtor-in-possession (DIP) financing. The table presents the results of Probit regressions. *LOGASSET* is the natural log of the book value of total assets as reported for the latest year before the firm's filing for Chapter 11. *LEVERAGE* is the ratio of the sum of long-term debt and current liabilities divided by the book value of total assets. *RETAIL* is a dummy variable equal to one if the firm's primary standard industrial classification (SIC) code is between 5200 and 5999. *PREPAK* is a dummy variable equal to one if the firm filed a prepackaged Chapter 11. *POST1992* is a dummy variable equal to one if the filing took place in the second half of the sample period (1993–1997). *CA/TA* is the ratio of current assets to total assets for the firm. In panel A the dependent variable is one if the firm filing for Chapter 11 received DIP financing and zero otherwise. In panel B the Probit is run in the subsample of firms that obtained DIP financing. The dependent variable is one if the firm filing for Chapter 11 received DIP financing from one of its prior lenders, and zero otherwise. Columns 3 and 6 show the change in probability associated with a $-1/2\sigma$ to $1/2\sigma$ shift around the mean of the continuous variables, holding all other variables constant at their mean. For dummy variables these columns report the change in probability associated with a change in the dummy variable from zero to one.

Variable	DIP determinants (panel A)			Inside DIP determinants (panel B)		
	Coefficient	Change in probability for $+/-\sigma/2$	T-ratio	Coefficient	Change in probability for $+/-\sigma/2$	T-ratio
Intercept	−5.376		−11.77***	1.571		1.87*
LOGASSET	0.769	0.186	11.59***	−0.219	−0.110	−2.26**
PREPAK	−0.412	−0.052	−1.74*	0.792	0.266	2.44**
LEVERAGE	−0.238	−0.022	−1.39	0.335	0.053	0.96
RETAIL	0.686	0.162	4.20***	0.002	0.001	0.01
POST1992	0.8654	0.221	5.97***	−0.043	−0.017	−0.19
CA/TA	1.677	0.064	4.82***	−0.897	−0.075	−1.62*
Number of observations	504			144		
Pseudo R^2	37.8%			7.4%		

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

firms with more current assets, and firms filing for Chapter 11 in the later half of the sample period.[10] Prepackaged filings are less likely to obtain DIP financing. This is intuitively appealing as the prepackaged filings are accompanied by a preapproved plan of reorganization. Thus in most prepackaged filings the borrower continues to have access to its existing credit lines, which obviates the need to obtain DIP financing. The coefficient for leverage is negative though not statistically significant. A firm's ability to obtain DIP financing is positively related to the ratio of current assets to total assets. This provides some support for the view that DIP lenders prefer to lend against liquid collateral. This result is also consistent with working capital intensive firms having higher demand for DIP financing.

We also examine whether firms financed by inside DIP lenders have different characteristics compared with firms financed by outside DIP lenders. We run a

[10] One could argue that the ability to get DIP financing can depend on the size of the loan requested (lender's exposure) relative to the size of the firm. To take account of this, for the subsample of firms for which the DIP amount is available, we rerun the regression using the ratio of the DIP loan to total assets as the dependent variable. Our results are similar.

Probit model within the sample of DIP financed firms with the dependent variable equal to one if the DIP financing is provided by the firm's pre-petition lender and zero if it is provided by a new lender. The results are reported in panel B of Table 3. We find that prepackaged filings that receive DIP financing are likely to receive it from their existing lenders. This result is not surprising given that the prepackaged filings are characterized by the concurrent filing of a plan of reorganization already approved by existing creditors. The coefficient for *LOGASSET* is negative and significant, as is the coefficient for *CA/TA*. One possible explanation is that the most advantageous or cheapest source of financing for smaller firms is their preexisting lenders. The results are also consistent with the conjecture that insiders lend more frequently to small firms for which they are at an informational advantage. As prior lenders, they are also more likely to finance prepackaged filings. These results emphasize the differences between obtaining DIP financing from inside lenders versus outside lenders.

4.2. Relationship between DIP financing and bankruptcy outcomes

The next question we address is whether DIP lending is related to emergence from the legal bankruptcy process. We use the following Probit model:

$$EMERGE_i = f(LOGASSET_i, \ LEVERAGE_i, \ RETAIL_i, \ CA/TA_i, \ DIP_i) \quad (2)$$

EMERGE, the dependent variable, equals one if the firm *I* either emerged as an independent entity or was acquired by or merged with another firm. The dependent variable is equal to zero if the firm converted its filing to Chapter 7 or liquidated or if there is no news of the firm having emerged.[11]

There are several reasons for the inclusion of the independent variables. A firm's industry may be material, as the costs of financial distress may differ from one industry to another. We also include the log of the firm's assets and leverage as controls, because these might hamper the firm's ability to emerge from bankruptcy. Further, over time the number of firms with smaller total and current assets filing for bankruptcy has increased. Insofar as firm types and characteristics can affect the likelihood of emergence, we control for these characteristics in our regressions.

A prepackaged filing is almost always accompanied by a plan of reorganization that has been accepted by all existing claim classes. This generally ensures that such firms will emerge from the reorganization process and do so fairly quickly. Further, one might argue that where Chapter 11 filing is prompted by the need to obtain DIP financing, it is likely to be a prepackaged filing. Hence we exclude prepackaged filings from our sample. We also exclude the control variable *POST1992* as no exogenous change in the bankruptcy law during the sample period predicts that the

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[11] Emergence is not the equivalent of value-maximization; it simply means that the firm has survived. Managers of distressed firms may prefer inefficient continuation as opposed to liquidation (see Bradley and Rosenzweig, 1992). Our presumption here is that reorganizations are better outcomes than liquidations from the perspective of the firm's senior creditors.

probability of emergence or the length of the reorganization period should be related to the timing of the Chapter 11 filing. However, including this variable (or excluding it from the earlier Probit) does not materially affect our results. As a robustness check, since the complexity of the capital structure may play a role in the reorganization process of the firm (see e.g., Gilson, John, and Lang, 1990) we collect data on the creditor classes in bankruptcy. This information is available for about 50% of the firms in our sample. We reestimate specifications in which we include the number of creditor classes as an independent variable. The results are similar.

Panel A of Table 4 shows the results of the Probit model. We report both the coefficients and the change in probability associated with a –1/2 to +1/2 standard deviation shift around the mean for continuous variables and for a change in the dummy variable from zero to one. As expected, larger firms are more likely to emerge successfully, consistent with the coefficient for *LOGASSET* being positive and significant. This result is consistent with Carapeto (1999), who also finds that larger firms are more likely to emerge from Chapter 11 (see also Denis and Rodgers, 2002). Leverage shows up as positive and marginally significant in our regressions, while the coefficient for current assets is negative and significant. One possible explanation for these results is that the nature of assets can affect the probability of emerging from bankruptcy. A larger proportion of current total assets implies that the liquidation value of such a firm is likely to be higher, as current assets have lower liquidity costs as compared with fixed assets. This is especially true if the distress is caused by industry-wide problems (see, e.g., Pulvino, 1999, who provides evidence that airline companies in distress consistently received significantly lower prices on sale of aircrafts compared with prices received by healthy industry counterparts). Evidence that firms with more current assets are less likely to emerge is also consistent with the argument that current assets are easier to divert for other purposes (see, e.g., Myers and Rajan, 1998) as compared with fixed assets.

Our main interest is in the sign of the coefficient for the *DIP* variable. The results show that it is positive and significant at the 5% level. Economically, the increasing probability of emergence associated with a change in the *DIP* variable from zero to one is also large at 13% and bigger than any of the other variables. Thus firms that obtain DIP financing are more likely to emerge successfully.

However, some additional issues need to be taken into account. Is the information revealed in DIP financing decision related to outcomes? From our Probit regression we know that DIP financed firms are marked by certain characteristics such as large asset size, large current assets to total assets, and is more typical in the retail industry. In other words the independent variable—i.e., the *DIP* dummy—is a function of known characteristics. One way of controlling for this is to form a control group. However, the limitations of forming a control group are well known. Not only are the criteria subjective, but there is also a loss of sample size issue regarding how much one can reduce the matching criteria limits and still retain an adequate sample size. Another way to address this issue econometrically is through selectivity methods (see Maddala, 1983; Greene, 1997; Lee, 1979; Heckman (1979), for some applications). This is the technique that we adopt in this paper.

Table 4

Debtor-in-possession (DIP) financing and the final resolution of the bankruptcy process. The table presents the results of Probit regressions. The dependent variable is one if the firm filing for Chapter 11 either emerged as an independent firm or was acquired or merged with another firm. It is equal to zero if the firm's filing was converted to Chapter 7 or the firm was liquidated or there is no information available. Prepackaged bankruptcies are excluded. *LOGASSET* is the natural log of the book value of total assets, as reported for the latest year before the firm's filing for Chapter 11. *LEVERAGE* is the ratio of the sum of long-term debt and current liabilities divided by book value of total assets. RETAIL is a dummy variable equal to one if the firm's primary standard industrial classification (SIC) code is between 5200 and 5999. *CA/TA* is the ratio of current assets to total assets for the firm. *DIP* is a dummy variable equal to one if the firm obtained DIP financing and zero otherwise. Column 3 shows the change in probability associated with a $-1/2\sigma$ to $1/2\sigma$ shift around the mean of the continuous variables, holding all other variables constant at their mean. For dummy variables these columns report the change in probability associated with a change in the dummy variable from zero to one. Panel A shows the Probit estimations. Panel B shows estimates with selectivity models. The model estimated is similar to the one in panel A with the *DIP* variable being replaced by *DIPLAMDA*. *DIPLAMDA* is the inverse mills ratio formed using estimates obtained from the Probit regression in this subsample where *DIP* is the dependent variable and the independent variables are same as those in Table 3.

Variable	Panel A			Panel B	
	Coefficient	Change in probability from $-\sigma/2$ to $+\sigma/2$	*T*-ratio	Coefficient	*T*-ratio
Intercept	−0.663		−2.16**	−0.895	−3.14***
LOGASSET	0.221	0.126	3.84***	0.283	5.86***
LEVERAGE	0.189	0.043	1.76*	0.179	1.66*
RETAIL	−0.067	−0.026	−0.45	−0.004	−0.03
CA/TA	−0.814	−0.077	−3.04***	−0.702	−2.68***
DIP	0.343	0.133	1.99**		
DIPLAMDA				0.237	2.22**
Number of observations	440			440	
Pseudo R^2	9.6%			9.7%	

*Significant at 10%.
**Significant at 5%.
***Significant at 1%.

Suppose the DIP financing decision is a Probit determined by $z_i'b+\eta_i$, where z_i is the vector of observable factors that are considered significant in determining whether the firm receives DIP financing. We estimate the effect of information in DIP financing on a variable, say, y_i, by estimating

$$y_i = x_i'\beta + \delta DIPLAMDA_i + u_i. \tag{3}$$

Under the assumption that η_i is normally distributed $(0, \sigma^2)$, in Eq. (3) we have the inverse mills ratio, DIPLAMDA, which is the conditional expectation of η_i given the *DIP* financing decision. The significance and the sign of the inverse mills ratio reveal whether, after taking observable factors into account, DIP financing still makes a difference to y_i. This technique estimates the information in DIP financing by

filtering out the effect of firm characteristics that lead to higher probability of reorganization and that contribute to the endogenous decision to grant DIP financing. This information could relate to a screening or monitoring effect, i.e. it could be private information about whether these are better projects or reflect how DIP financiers expect to influence outcomes through monitoring.

To implement this technique we use a two-step method. In the first step, we estimate a Probit equation with DIP financing as the dependent variable, as in Eq. (1). We use the estimates of the Probit equation to form the inverse mills ratio, which we then plug into the second step regression. In the second step, the regression used as in Eq. (2) but we replace the DIP dummy with an independent variable called *DIPLAMDA*, which represents the inverse mills ratio, along with all other variables that may directly affect the time to resolution. Panel B of Table 4 shows the selectivity results, which are similar to our previous results. This tells us that, after taking observable factors into account whether *DIP* financing variable is still a significant determinant of emergence from bankruptcy. As a robustness check, in unreported regressions, we also redo the estimation as a maximum likelihood bivariate Probit and obtain similar results. All combined, these results suggest that DIP financing is positively related to the probability of emergence from bankruptcy.

As discussed in Section 3, DIP financing is less likely to lead to overinvestment if an inside lender provides this financing. This implies a higher likelihood of emergence for these firms compared with those financed by an outsider. If there is little systematic overinvestment, there should be no significant differences in the likelihood of emergence for inside and outside DIP financed firms. We run a Probit model specification of the following form:

$$EMERGE_i = f(LOGASSET_i, LEVERAGE_i, RETAIL_i, CA/TA_i, SAME_i). \quad (4)$$

SAME is equal to one if the DIP financing was provided by the existing lender and zero otherwise. We find that the coefficient for the dummy variable *SAME* is negative but not significant (the results are not reported but are available on request from the authors). We reestimate the Probit with selectivity models, and the results remain largely unchanged. This suggests that both inside and outside DIP financiers tend to fund positive NPV projects with higher likelihood of emergence from the bankruptcy process.

4.3. Relationship between DIP financing and speed of bankruptcy resolution

We test whether DIP financing is associated with shorter time to resolution, both for emergence from Chapter 11 and for unsuccessful outcomes or liquidations. We estimate a regression of the following form:

$$RESOLPRD_i = f(LOGASSET_i, LEVERAGE_i, RETAIL_i, CA/TA_i, DIP_i), \quad (5)$$

$RESOLPRD_i$ is the resolution period, defined as the number of days from the date of the Chapter 11 filing to the date on which the firm's plan of reorganization is

confirmed by the court or the date on which the court approved a plan of liquidation or a major asset sale. All firms for which resolution and its timing are known are included in this analysis, while prepackaged bankruptcies are excluded. We also exclude firms for which we do not yet have an outcome. We first run this estimation with time to emergence as the dependent variable. This sample does not include filings resulting in liquidation, substantial asset sales, or conversion to Chapter 7. An additional complication is that in our sample a resolution date was not available for a number of firms at the time of our research (June 30, 1999). For these firms it is reasonable to assume a positive probability of emergence from the reorganization process. Our data are right censored, and we take this censoring into account by running a censored normal regression taking the upper censoring to be June 30, 1999. This is similar to a standard Tobit regression that is typically left censored at zero (though the censoring can be at different limits).

Panel A of Table 5 provides the results of this regression. We find that the coefficient for *DIP* is negative and significant. Economically, the coefficient for *DIP* is larger than any of the other independent variables. This is consistent with the argument that DIP lending helps identify or facilitate a faster resolution. It is also consistent with our earlier results from the Probit tests, which found that firms with a higher probability of emerging from bankruptcy are more likely to obtain DIP financing.

We run robustness checks to address some issues in estimation. In particular, we estimate selectivity models, replacing the *DIP* dummy in the regression by the inverse mills ratio (estimated from the Probit). The results are reported in panel B of Table 5 are similar to those reported in panel A. It appears that larger firms spend less time in Chapter 11, but they are also more likely to obtain DIP financing. We are interested in the marginal effect of DIP and find that DIP lending occurs for firms where the reorganization period is shorter, after taking the size of the firms' assets into account. Bootstrapped standard errors give similar results with significance at 1%. The results suggest that, DIP financing is significantly related to reduced time to emergence.

We also test how DIP financing relates to time to liquidation. In this case, we examine only those firms for which the outcome was liquidation, conversion to Chapter 7, or substantial asset sales. We estimate the effect of DIP financing on the time to liquidation. As in earlier tests, we run a regression both with and without selectivity models, which are reported in panels C and D, respectively, of Table 5. We find that within firms that liquidate, larger firms take longer to liquidate, perhaps because of coordination problems. For our purpose we are interested in the effect of DIP financing on time to liquidation, and we find in both estimations, with and without selectivity estimations, that DIP financing is associated with a statistically significant shorter time to liquidation. Further, the economic effect of such financing is larger than any of the other independent variables in our regressions. Two interpretations can be made of these results. The first interpretation is that DIP financing is value-creating because if the investment does not do well, the DIP financier facilitates a fast liquidation and prevents further value loss (caused by asset deterioration and other direct and indirect costs of

Table 5

Debtor-in-possession (DIP) financing and speed of resolution. In panel A, we examine time to emergence. The dependent variable is the length of the resolution period for the Chapter 11 filing firm defined as the number of days from the date of Chapter 11 filing to the date of the resolution of its reorganization process. The sample does not include filings resulting in liquidation, substantial asset sales, or conversion to Chapter 7. Prepackaged bankruptcies are excluded. LOGASSET is the natural log of the book value of total assets as reported for the latest year before the firm's filing for Chapter 11. LEVERAGE is the ratio of total book value of liabilities divided by book value of total assets. RETAIL is a dummy variable equal to one if the firm's primary standard industrial classification (SIC) is between 5200 and 5999. CA/TA is the ratio of current assets to total assets for the firm. DIP is one if the firm received DIP financing and zero otherwise. The model includes the firms for which no resolution date is available. Thus the reorganization process for these firms is taken to be right censored as of June 30, 1999. Panel B estimates the same regression with selectivity models, with the independent variable DIP being replaced by DIPLAMDA. DIPLAMDA is the inverse mills ratio formed using estimates obtained from the Probit regression in this subsample where DIP is the dependent variable and the independent variables are same as those in Table 3.

	Panel A		Panel B	
Variable	Coefficient	*T*-ratio	Coefficient	*T*-ratio
Intercept	871.198	3.97***	1049.166	5.15***
LOGASSET	−2.633	−0.07	−49.025	−1.61*
LEVERAGE	−114.522	−1.49	−106.428	−1.38
RETAIL	−29.393	−0.29	−71.743	−0.71
CA/TA	103.442	0.53	2.037	0.01
DIP	−248.331	−2.11**		
DIPLAMDA			−117.118	−1.63*
Number of observations	268		268	
R^2	0.2%		0.2%	

In panel C we examine time to liquidation. The dependent variable is the length of the resolution period for the Chapter 11 filing firm defined as the number of days from the date of Chapter 11 filing to the date of the resolution of its reorganization process. Unlike panel A, the sample includes only filings resulting in liquidation, substantial asset sales, or conversion to Chapter 7, so we are effectively measuring time to liquidation. The independent variables used are the same as those in panel A. Panel D estimates the same model as panel C, with selectivity models, with the independent variable DIP being replaced by DIPLAMDA. DIPLAMDA is the inverse mills ratio formed using estimates obtained from the Probit regression in this subsample where DIP is the dependent variable and the independent variables are same as those in Table 3.

	Panel C		Panel D	
Variable	Coefficient	*T*-ratio	Coefficient	*T*-ratio
Intercept	119.761	0.67	341.440	2.029**
LOGASSET	108.736	2.64***	49.901	1.657*
LEVERAGE	60.335	0.82	70.344	1.124
RETAIL	35.948	0.54	−26.388	−0.330
CA/TA	27.958	0.17	−68.080	−0.443
DIP	−343.952	−3.97***		
DIPLAMDA			−185.269	−2.985**
Number of observations	168		168	
R^2	9.01%		4.0%	

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

financial distress).[12] The second interpretation is that claims of other creditors are impaired by the forced fire sale of assets in liquidation, while the DIP lender is able to fully recover loans because of their superpriority status. However, the second interpretation is not consistent with the event study evidence in Chatterjee et al. (1997), which shows that existing debt-holders gain when DIP financing is announced. Hence it would appear that faster liquidation (and faster emergence) is one of the channels through which existing claimholders gain when a DIP financier comes in. The faster liquidation result suggests a monitoring role of the DIP lender as opposed to a pure screening role alone.[13]

4.4. Insiders versus outsiders

We estimate the regression for the dependent variable *RESOLPRD* for the sample of firms that received DIP financing and did not file a prepackaged Chapter 11. We test for the impact of the lender's identity by including the dummy variable *SAME* as an independent variable. Our results reported in panel A of Table 6 show that *SAME* is significant at 10%, providing some empirical support for the assertion that firms obtaining DIP financing from existing lenders tend to emerge from Chapter 11 more quickly than firms obtaining DIP financing from a new lender. Results with selectivity models are similar (standard errors adjusted as in Greene, 1997; Maddala, 1983) and are reported in panel B of Table 6. This is consistent with the notion that insiders have the incentives and private information necessary to identify and facilitate faster emergence from bankruptcy.

We also test whether inside DIP is also associated with reduced time in bankruptcy for the unsuccessful outcomes, i.e., liquidations. For firms that are liquidated, we run regressions similar to those described above. The results are reported in panels C and D of Table 6. We find that inside DIP is associated with a significantly faster time in liquidation than outside DIP. Combined with earlier results, this suggests that inside DIP financiers identify or facilitate reduced time in bankruptcy for both successful emergences and liquidations. This could be because of the two differences between an insider and an outsider (insider's larger exposure and better information). These differences can provide stronger incentives to an inside lender to bring the Chapter 11 process to a close, in one way or another, as quickly as possible.

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[12] The direct and indirect costs of financial distress have been examined by a number of researchers. Bergman and Callen (1991) provide a theoretical analysis in which, for potentially distressed firms, the management threatens to run down firm assets. Empirically, Weiss and Wruck (1998) document such wealth destruction in the case of Eastern Airlines' reorganization process.

[13] The role of a bank as monitor and information producer is widely modeled in the finance literature. See, for example, Campbell and Kracaw (1980), Diamond (1984), Gande et al. (1997), James (1987), and Puri (1996, 1999). The importance of bank relationships is captured in a number of papers e.g., Berger and Udell (1995), Boot and Thakor (2000), and Peterson and Rajan (1994).

Table 6

Inside debtor-in-possession (DIP) financing and speed of resolution. In panel A, we examine time to emergence. The dependent variable is the length of the resolution period for the Chapter 11 filing firm defined as the number of days from the date of Chapter 11 filing to the date of the resolution of its reorganization process. The sample does not include filings resulting in liquidation, substantial asset sales, or conversion to Chapter 7. Prepackaged bankruptcies are also excluded. *LOGASSET* is the natural log of the book value of total assets as reported for the latest year before the firm's filing for Chapter 11. *LEVERAGE* is the ratio of total book value of liabilities divided by book value of total assets. *RETAIL* is a dummy variable equal to one if the firm's primary standard industrial classification (SIC) code is between 5200 and 5999. *CA/TA* is the ratio of current assets to total assets for the firm. *SAME* is a dummy variable equal to one if the firm received DIP financing from one of its prepetition creditors and zero otherwise. Panel B estimates the same model with selectivity models, with the independent variable *SAME* being replaced by *SAMELAMDA*. *SAMELAMDA* is the inverse mills ratio formed using estimates obtained from the Probit regression in this subsample where *SAME* is the dependent variable and the independent variables are the same as those in Table 3. The regressions are run within the sample of DIP financed firms.

Variable	Panel A		Panel B	
	Coefficient	*T*-ratio	Coefficient	*T*-ratio
Intercept	246.21	1.28	157.568	0.82
LOGASSET	87.756	3.48***	91.165	3.87*
LEVERAGE	−134.884	−3.67***	−145.828	−2.13**
RETAIL	36.820	0.60	39.383	0.64
CA/TA	−108.582	−0.71	−55.439	−0.36
SAME	−100.334	−1.64*		
SAMELAMDA			−69.650	−1.84*
Number of observations	89		89	
R^2	24.5%		20.5%	

In panel C we examine time to liquidation. The dependent variable is the length of the resolution period for the Chapter 11 filing firm defined as the number of days from the date of Chapter 11 filing to the date of the resolution of its reorganization process. The sample includes only filings that resulted in liquidation, substantial asset sales, or conversion to Chapter 7. Independent variables used are the same as in panel A. Panel D estimates the same model as panel C, with selectivity models, with the independent variable *SAME* being replaced by *SAMELAMDA*. *SAMELAMDA* is the inverse mills ratio formed using estimates obtained from the Probit regression in this subsample where *SAME* is the dependent variable and the independent variables are the same as those in Table 3. The regressions are run within the sample of DIP financed firms.

Variable	Panel C		Panel D	
	Coefficient	*T*-ratio	Coefficient	*T*-ratio
Intercept	291.426	0.84	134.050	0.32
LOGASSET	72.887	1.41	103.033	1.87*
LEVERAGE	0.930	0.01	−102.952	−0.51
RETAIL	59.374	0.59	31.151	0.29
CA/TA	−253.878	−1.05	−334.795	−1.12
SAME	−221.115	−1.64*		
SAMELAMDA			−131.564	−2.05**
Number of observations	33		33	
R^2	28.3%		14.7%	

*Significant at 10%. **Significant at 5%. ***Significant at 1%.

4.5. Robustness checks

In this section we conduct some additional robustness checks. In our tests of the relationship between DIP financing and a firm's reorganization process, we present results for the subsample of firms that did not file a prepackaged Chapter 11. This is done to eliminate the well-documented findings (Tashijian et al., 1996) that prepackaged filings always lead to successful emergence of the filing firm. Because a creditor-approved plan of reorganization is a key feature of a prepackaged filing, the time spent in reorganization is significantly shorter for such filings. We reestimated our results for the entire sample (prepackaged and nonprepackaged filings) and included a dummy variable for prepackaged filings. The results are similar to those reported earlier.

Rohman (1990) and Rizzi (1991) discuss the special attraction of retail firms to DIP lenders and how retailers have a higher demand for DIP financing. Hence we include a dummy variable for the retail industry in our model specification. As a robustness check, we rerun our regressions using one-digit SIC codes as dummy variables instead of the retail industry dummy. The results are qualitatively similar.

Finally, we use a *POST1992* dummy in Table 3. As a robustness check we rerun these regressions using a *POST1994* dummy and find qualitatively similar results. Further, in the Probit tests estimating the likelihood of emergence from bankruptcy, we had excluded the *POST1992* dummy as a control variable because we felt there was no significant change in the bankruptcy law or economic reason to include this as a control. However, insofar as there is a growth in DIP financing in the *POST1992* period, one might argue that a case can be made for the inclusion of such a dummy. Accordingly, we reestimate our Probit tests including the *POST1992* dummy as a control variable. The results are similar.

5. Conclusion

A major debate in the law and economics literature focuses on the efficacy of DIP financing. Opponents of DIP financing argue that allowing borrowing on terms of superior priority and security adversely affects the existing claims of a firm's creditors, as it may encourage investment in risky and possibly negative NPV projects. Supporters, argue that DIP financing has a more positive role, benefiting all stakeholders by allowing the firm to undertake positive NPV projects. A related question is whether DIP financing prolongs or shortens the time in bankruptcy.

To examine these questions we collect a large sample of firms that filed for bankruptcy under Chapter 11. We find that DIP financing is associated with a higher probability of emergence as well as a shorter time in bankruptcy (both for firms that reorganize and for firms that liquidate). These results are consistent with DIP lenders having an information based role; playing a screening role in which they fund firms with positive NPV projects, or playing a monitoring role in which they facilitate a successful outcome for firms that they finance and help speed up the ultimate outcome (whether emergence or liquidation).

We also examine whether the identity of the DIP financier—whether a prior lender (insider) or a new lender (outsider)—makes a difference on any of these dimensions. We find that smaller firms tend to obtain DIP financing from their existing lenders. This is consistent with prior lenders having private information about these firms, which gives them a comparative advantage in providing DIP financing to smaller, more information-sensitive firms. We find that inside DIP financing is significantly associated with reduced time in bankruptcy, both for firms that emerge from Chapter 11 and firms that liquidate.

Overall, our evidence suggests that DIP financiers identify firms with positive NPV projects or facilitate successful outcomes, and can facilitate a reduced time in bankruptcy. The results on faster bankruptcy resolution hold for both successful (emerge from Chapter 11) and unsuccessful (liquidation) outcomes. The effect of reduced time in bankruptcy for the firm is strengthened when the DIP lender also has a prior lending relationship with the firm.

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