Trade Creditors' Information Advantage

Victoria Ivashina

Harvard University and NBER

Benjamin Iverson

Brigham Young University

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Using information on the sales of debt claims for 132 U.S. Chapter 11 bankruptcy cases, we show that large trade creditors' decisions to sell receivables of a distressed company in bankruptcy are predictive of lower recovery rates, and that in such cases these creditors sell ahead of less informed suppliers and other creditors. This result is especially pronounced for more opaque distressed firms, when trade creditors' information advantage is likely largest. This evidence shows that suppliers that extend significant amounts of trade credit hold private information about their trade partners. Trade creditors who are geographically closer or in similar industries tend to lend the most, suggesting that these are two channels through which suppliers hold an information advantage.

Keywords: Trade Credit; Distress; Bankruptcy
JEL classification: G21, G30, G32, G33

The authors can be contacted via the following email addresses: Victoria Ivashina: vivashina@hbs.edu; Ben Iverson: biverson@byu.edu.

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1. Introduction

Trade credit is a key source of financing for U.S. corporations.[1] There are several potential explanations for why this is the case: compared to other creditors, suppliers might be better informed about the trade partners' business (e.g., Biais and Gollier, 1997; Bukart and Ellingsen, 2004; and Fabbri and Menichini, 2010) or about their product quality (Smith, 1987). Trade ties might be a more effective governance mechanism (e.g., Wilner, 2000; Cunat, 2007). Due to transaction costs, trade credit might simply be the cheapest source of short term financing (Ferris, 1981). It could also be an indirect form of price discrimination (e.g., Brennan, Maksimovic, and Zechner, 1988). These explanations are not mutually exclusive. Perhaps this is why the financial literature has struggled to find evidence for the specific channels that might give rise to trade credit.

In particular, while an informational advantage of suppliers is an intuitive explanation of the widespread use of trade credit, there is little empirical support for this hypothesis. Petersen and Rajan (1997) look at the cross-section of firms covered by the 1988-1989 National Survey of Small Business Finances (NSSBF) and show that—contrary to theories of supplier information advantage—it is larger, and not smaller, firms that tend to use more trade credit. Similar results emerge when Petersen and Rajan (1997) compare the NSSBF sample to Compustat. However, this is in contrast to findings in the banking literature that—consistent with informational advantage of banks—smaller, unrated and private firms are more likely to use bank debt.[2] Overall, most of the evidence to date points to trade credit being used as financing of last resort, rather than suppliers

[1] Rajan and Zingales (1995) show that trade credit represents 22.8% of the liabilities of public U.S. firms. In a more recent study Ivashina, Iverson and Smith (2016) look at a sample of public and private firms filing for Chapter 11 bankruptcy and find that 97% of all firms rely on trade credit, and that trade credit, on average, represents 22.5% of all liabilities. Barrot (2016) also points out that, based on the U.S. Flow of Funds Accounts, the aggregate accounts payable on the balance sheet of non-financial U.S. firms are three times larger than bank credit and fifteen times larger than commercial paper.

[2] For example, Bharath, Dahiya, Saunders, and Srinivasan (2007) show that smaller firms, as well as firms without credit ratings, are more likely to form banking relationships.

holding an informational advantage. Petersen and Rajan (1997), and more recently Giannetti, Burkart and Ellingen (2008), show that NSSBF firms with weaker banking relationships have higher accounts payable. Nilsen (2002), Garcia-Appendini, and Montoriol-Garriga (2013), and Carbo-Valverde, Rodriguez-Fernandez, and Udell (2014) show that trade credit increases when bank credit contracts. Similarly, cross-country studies show that use of trade credit is higher in countries with less developed banking systems (e.g., Demirgüc-Kunt and Maksimovic, 2001; Fisman and Love, 2003). And, although trade credit responds to repeated transactions and new information about the borrower (Antràs and Foley, 2014; Klapper, Laeven and Rajan, 2011), the conclusion in the literature is that non-financial motives appear to be the key drivers of trade credit.

In this paper, we reexamine whether suppliers hold private information about their trade partners by analyzing their behavior in bankruptcy. When a trade partner files for Chapter 11 bankruptcy, suppliers can either hold on to their receivable and wait for the bankruptcy process to work out, or they can sell their receivable to a third party. Using data on such in-bankruptcy decisions and their timing, we find evidence consistent with suppliers holding private information. The bankruptcy setting helps us to isolate the information channel from several other types of frictions. The basic intuition is that many of the factors that might influence the decision to grant trade credit to a client do not influence the decision to continue holding the trade credit of a bankrupt firm. While transaction costs and price discrimination might have been among the factors that influenced the initial decision to extend trade credit, these factors are not likely to influence the decision and timing of the sale of a receivable of a bankrupt firm. Similarly, the effectiveness of trade ties as a governance mechanism is not relevant in bankruptcy because Chapter 11 does not allow for individual concessions. On the other hand, information about the fundamentals of the bankrupt firm in the hands of the suppliers is clearly something that would influence the

decision to sell or hold receivables. We show that those suppliers who appear to be trading on such information are also the suppliers who extend the most trade credit relative to their capacity.

The onset of bankruptcy triggers the sale of receivables for a variety of reasons. From a purely practical standpoint, sales of individual receivables are difficult outside of bankruptcy due to a lack of information on the identity of trade partners.[3] More importantly, there are non-trivial fixed costs of being a creditor of a bankrupt firm, such as serving on or interacting with creditor's committees, voting on the plan of reorganization and other issues that require legal expertise and attention for, on average, two years. These costs could outweigh the expected recovery for some suppliers. Further, liquidity constraints could prohibit trade creditors from waiting until the resolution of the case to receive payment for their claim.

Meanwhile, for financial buyers the cost of holding bankrupt claims is lower because they are specialists in the bankruptcy process, they can reduce the impact of fixed bankruptcy costs by consolidating claims, and act as intermediaries in the market for bankrupt claims more broadly. Consistent with this intuition, Ivashina, Iverson, and Smith (2016) show that, in bankruptcy, the bulk of trade credit is purchased by financial buyers. The gains from trade, combined with the fact that some of the suppliers are motivated to sell, creates a natural market for receivables. Because financial buyers are less informed about the bankrupt company's fundamentals, as in a standard asymmetric information model, they buy the trade claim at a discount to fair value.[4]

[3] Out-of-bankruptcy trade claims can be sold as a portfolio; this is a common practice that is called "factoring." Factoring, however, is not informative about individual trade relationships. In general, there is little to no information about trade credit out of bankruptcy. Once in bankruptcy, a firm releases the Schedule of Assets and Liabilities, which provides detailed information on individual stakes and contact information of all creditors.

[4] For example, in Akerlof's (1970) classic lemons model a pooling equilibrium exists in which all types of sellers can sell despite adverse selection as long as the gains from trade are large enough. Due to adverse selection, buyers will purchase claims at a discount. Empirically, we do not observe in-bankruptcy prices, but from interviews of financial buyers of distressed claims we know that trade claims are indeed purchased

To derive our testable hypotheses, we envision a simple setup where trade creditors are differentially informed about the net recovery rate. At the onset of bankruptcy, informed creditors know this information, whereas uninformed trade creditors only know the distribution of potential net recovery values. As the bankruptcy case progresses, uninformed suppliers learn more about the net recovery rate and, since the cost of dealing with a bankruptcy claim is distributed over time, they wait to sell until they have more precise information, unless they cannot afford to do so. In this setting, informed suppliers will sell their claims at the onset of bankruptcy if the expected recovery rate is low, when all the suppliers receive a standard offer from the financial buyer.[5] Thus, empirically, we expect that ex-ante informed suppliers would sell their stake if the realized recovery rate is low, and do so ahead of other trade creditors. For a given bankruptcy case, we identify suppliers with high $Trade\ credit_{ij}/Total\ asset_j$ ratios—where *i* denotes a bankrupt firm and *j* denotes the supplier—as more informed. The underlying assumption is that a supplier with a large exposure to a bankrupt firm will be more informed about that client.

Our data covers 132 U.S. bankruptcy cases (including 68 private firms) filed between 1998 and 2009. In addition to in-bankruptcy transactions, we observe a complete and detailed snapshot of the capital structure of these distressed firms at the moment of bankruptcy. We start by showing that—contrary to the finding in Petersen and Rajan (1997) and consistent with the information advantage hypothesis—reliance on trade credit is strongly correlated with the size and public-vs.-private status of the firm. On average, private firms' use of trade credit as a fraction of total liabilities is 7.6 percentage points higher (or over 40% higher) than that of public firms.

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at a steep discount. We provide more details of the interaction between buyers and sellers when discussing results.

[5] In this simple framework, financial buyers are uninformed and so they set a standard discount at the beginning of the bankruptcy. As more information becomes known by both buyers and sellers, this offered discount will change. This is another reason why informed sellers would sell claims early in low-recovery cases.

Our main tests use individual transfers of trade claims collected from filings under the Rule 3001(e) of the Federal Rules of Bankruptcy Procedure. We do not observe prices at which trade claims are sold, but we know the counterparties, the face value of the transaction, and, for a subset of cases, the date of the transaction. In total, we observe 28,072 trade credit contracts, held by 14,870 different suppliers, of which 2,176 are sold before the bankruptcy case is resolved. We show that suppliers that are likely to have more private information are significantly more likely to exit their positions in anticipation of low recovery rates. In other words, their trading behavior predicts claim-level recovery rates. This is especially true for private distressed firms in our sample, consistent with the idea that suppliers will have the largest informational advantage for opaque firms that turn to trade credit as a key source of financing. Indeed, we also show that this result is strongest for distressed firms that rely heavily on trade credit as a source of financing. Furthermore, when recovery rates are lower, more informed suppliers (1 standard deviation in our measure) lead the market by selling their positions, on average, three months ahead of less informed suppliers.

A possible alternative explanation for these findings is that an informed supplier's decision to hold a trade claim is influenced by a desire to preserve a relationship with the bankrupt firm (in expectation that the firm will emerge from Chapter 11). Indeed, consistent with this interpretation, we do observe that sales by informed suppliers are correlated with a lower likelihood of reorganization. However, we find that sales by informed suppliers predict low recoveries even when we control for the outcome of the bankruptcy. That is, our main results hold within cases that eventually emerge from bankruptcy making it unlikely that the findings are driven by relationship-based theories of trade credit.

Finally, we examine two channels through which suppliers might hold an information advantage: geographic proximity and industry similarity. We show that in our sample 42.5% of trade creditors are located within 200 miles of the debtor firms, a higher percentage than any other creditor group. We also show that suppliers that are located nearby, or that are in similar industries to their trade partners, tend to extend more credit relative to their capacity. These findings are similar to the evidence on geographical proximity being important for information transmission in banking (e.g., Petersen and Rajan, 2002; Mian, 2006; and Sufi, 2007).

The rest of the paper is organized in four sections. Section 2 develops our empirical hypotheses. Section 3 describes the data. Section 4 presents evidence that suppliers hold an information advantage. Section 5 examines the channel through which they obtain information, and Section 6 concludes.

2. Information frictions and trade credit

Existing literature articulates three main channels that might explain why a supplier is able to deal with informational frictions about the borrower better than banks or other financial intermediaries. Petersen and Rajan (1997) and Cunat (2007) postulate that suppliers have mechanisms of control over the buyer that a bank may not have. For example, some trade relationships might not be easy to replace, so the threat of cutting off a supplier relationship might be more effective than any covenant provisions included in a loan contract. While such mechanisms might be relevant when trade credit is issued, they have no impact on the supplier's decision to sell the receivables of a bankrupt creditor. Similarly, suppliers' liquidation advantage—that is, their potentially superior ability to re-sell the supplied goods (Petersen and Rajan, 1997; Fabbri and Menichini, 2010)—does not matter for receivables of a bankrupt firm because the automatic stay prevents all creditors from seizing assets. Further, our data provides the insight that

the vast majority of trade credit is unsecured in the first place: across all trade claims less than 5% (or 13%, weighted by value) are secured.[6] As unsecured creditors, trade creditors who do not sell their payables during the bankruptcy typically receive cash, new debt, or new stock as payment for their claims. Thus, the fraction of trade credit where a supplier may directly repossess the goods from the debtor is economically small.

The remaining information channel points to the trade creditors' advantage in screening and monitoring the borrower, and this is the empirical insight that emerges from our study. The supplier may understand the business better, visit the buyer more frequently, and receive more accurate and timely information (embedded in the buyer's orders and financing decisions) than a banker. To the degree that this insight helps the suppliers to understand a firm's level of distress and the potential complexity of the restructuring process, we expect that trade creditors' decisions to hold or liquidate receivables of a bankrupt trade partner will relate to the outcomes of the bankruptcy, particularly the recovery rate.

Given that one potential outcome of bankruptcy is that the company is reorganized and survives as an independent entity (as opposed to being sold or liquidated), we pay special attention to trade credit theories that focus on the production relationship between trade partners. The basic point of such theories is that if a firm in financial distress generates a large fraction of the supplier's profits (i.e., the supplier is dependent on the debtor), then those creditors would be more likely to grant concessions (Wilner, 2000). But, in bankruptcy, there is no place for direct concessions from suppliers, who are likely to be grouped with—and to receive the same recovery as—other unsecured creditors.

[6] Much of the secured trade credit is concentrated in just a few bankrupt firms. In the median firm, less than 1% of trade credit is secured, while eight cases have over 50% of trade credit secured. As we will illustrate later, this is characteristic of the general distribution of trade claims, and not just the distribution of trade claims for firms near bankruptcy.

A related relationship-based explanation is put forward by Garcia-Appendini and Montoriol-Garriga (2015), who empirically show that if the business model of a supplier depends on the survival of the distressed trade partner, the supplier is likely to continue granting trade credit leading up to the bankruptcy. Extending this idea to the bankruptcy setting, suppliers might hold onto their receivable in bankruptcy if that makes survival of their trade partner (and trade relationships) more likely. Indeed, Ivashina, Iverson, and Smith (2016) show that strategic financial investors (including hedge funds and private equity funds) purchase a large fraction of claims during bankruptcy, and that such investors are more likely to pursue liquidations and sales. Thus, an informed supplier might choose to hold on to their claim even knowing the recovery rate is low if they feel it increases the chance of survival for the bankrupt firm. However, this requires that the dependent supplier *j* to firm *i* (high $Trade\ credit_{ij}/Total\ asset_j$) also happens to be an important creditor to the debtor (high $Trade\ credit_{ij}/Total\ asset_i$). In other words, this alternative explanation of trading patterns corresponds to a different proxy, although the two variables may be correlated. But, if that is the case, the prediction is that sales by informed trade creditors would happen in those cases where recovery rates are high (which runs opposite to the information-based hypothesis).[7] Such cases should also lead to more frequent reorganizations. We test this empirically in Section 4.2.

3. Data

In-bankruptcy ownership and transaction data comes from four leading providers of restructuring and insolvency administrative services: BMC Group, Donlin Recano & Company,

[7] This also is consistent with the prediction that emerges from Franks and Nyborg (1996), which concerns deviation from absolute priority when creditors are dependent on a bankrupt debtor.

EPIQ Bankruptcy Solutions, and Kurtzman Carson Consultants (KCC).[8] These claims administrators are hired by Chapter 11 debtors to amass and disclose to the court information on all claims and claimholders in a case. Table 1 reports summary information on the 132 bankrupt firms in our sample, and compares the distribution of our sample to the firms in the UCLA-LoPucki Bankruptcy Research Database (BRD) that filed for bankruptcy between 1998 and 2009.[9] Bankruptcies in our sample derive more heavily from the latter half of the sample period, when online disclosures and the electronic storage of data by claims administrators became common. The median size of firms in the BRD is over two times larger than the firms in our sample; this is because over half of our sample consists of private firms. However, very small bankrupt firms typically do not hire claims administrators and therefore are not part of our sample.[10] Given that there is more public information about larger companies, a bias toward larger companies makes it harder to identify information advantage of trade creditors.

[TABLE 1]

Information on *all* suppliers and claims against the debtor at the time of bankruptcy comes from the Schedules of Assets and Liabilities, which are filed when a firm enters Chapter 11. In-bankruptcy trading is observable for all claims that are required to submit proofs of ownership transfer under Rule 3001(e) of the Federal Rules of Bankruptcy Procedure; that is, any traded bankruptcy claim that is not "based on a publicly traded note, bond, or debenture." Finally, we also observe voting claimants (primarily comprised of unsecured creditors, including trade

[8] The data is public, as are all the documents that are used in bankruptcy court. However, consolidating these documents, and specifically the trade transactions, into one dataset represents a substantial challenge.
[9] The BRD (http://lopucki.law.ucla.edu/) is a database commonly used in academic research. It tracks all SEC-registered firms that file for bankruptcy with assets greater than $100 million in 1980 dollars.
[10] Firms in our sample are substantially larger than the firms in the NSSBF sample: average assets for the firms surveyed in 1998 are $1.5 million, as compared to average assets of $1.9 billion in our sample ($713 million for private firms).

creditors) at the tabulations of votes on Plans of Reorganization near the end of the bankruptcy. We use this last snapshot of claimholders to track the recovery rate that trade creditors eventually receive, or, if they sold their claims, the recovery rate received by the buyers of the claims.

The proof of transfer under Rule 300l (e) includes the identity of the claim, the names of the seller and the buyer, and the face value of the claim. To isolate trade credit from other Rule 3001(e) claims, including derivatives and swaps, intracompany claims, rejected leases, and tax claims, we use a variety of techniques to categorize creditors using their names. Primarily, we match by name to company and institution lists produced from Standard and Poor's *CapitalIQ*, the *BarclayHedge* archive of hedge fund managers, and databases from *The Deal Pipeline*. We also identify creditors by common naming conventions. For example, non-financial firms typically include "Inc" or "Corp" in their name, while financial firms are more often limited partnerships or LLCs. We also check the matches by hand for accuracy. We consolidate trade creditors at the parent level and exclude any financial and government institutions. We treat consulting, law, and healthcare companies as part of trade credit; these firms account for less than 10% of the total corporate claims.

We verified the accuracy of our categorization in two ways. First, we mapped firms classified as suppliers to CapitalIQ and Experian Small Business records. In total, we matched 75% of claimants under Rule 3001(e) that appear to be suppliers (or 86% by value of claims). Using this mapping, we were able to compare the industry distribution of trade partners in our sample to input-output tables put together by the Bureau of Economic Analysis (BEA) that provide information on the flow of goods and services that make up the production processes of industries. As reported in Table 2, the trade creditors' industry distribution in our data is very similar to the BEA data. Second, we took a detailed look at several bankruptcies to confirm that the list of

suppliers is consistent with what one would expect. For example, for Collins & Aikman, a manufacturer of automotive interior components, systems, and modules, we find that its largest suppliers according to our database are JPS automotive, a manufacturer of automotive textiles; Becker Group, an automotive plastics maker; Carcorp, a car dealer; Dura Automotive, a manufacturer of variety of auto related systems including cables, seating control, and engineered assemblies; and Southwest Laminates, a manufacturer of automotive fabrics. Similarly, for Kmart, we find that its largest suppliers are Fleming Companies, a food distributor; D&J Limited Partnership, a clothing manufacturer; Handleman, a music, video and other media distributor; Universal Music and Video, another media distributor; and Premier Retail Networks, an in-store marketing firm.

[TABLE 2]

Ultimately, we want to gain insight on the role of private information in the decision to extend trade credit, so we also verify that reliance on trade credit and the composition of suppliers at bankruptcy (our sample) is representative of the use of trade credit by non-bankrupt firms. Overall, it does not appear that the companies in our sample appreciably change their reliance on trade credit as a source of financing as they near bankruptcy. The reliance on the trade credit in our sample closely matches the use of trade credit in the public data: trade credit represents 22.5% of total liabilities in our sample, 22.8% in Rajan and Zingales (1995), and 23.4% across all firms in Compustat from 1998-2009. Fig. 1 shows the evolution of reliance on trade credit for public firms in our sample in the five years prior to bankruptcy. The chart displays the mean deviation of accounts payable as a fraction of total assets.

[FIGURE 1]

We also need to consider changes in the composition of the creditors leading up to the bankruptcy. For example, it could be that more informed suppliers sell their claims before the bankruptcy. Note that there would still be some sorting between more and less informed suppliers among those that stay, which is the basis for our results. Indeed, if it is the case that the most informed suppliers exit before bankruptcy, doing so ahead of everybody else, this is consistent with what we find, and the absence of these observations in our sample biases against our findings. But such bias is unlikely to be large: first, it is not clear that creditors can exit abruptly because a run by informed suppliers could precipitate firm's bankruptcy by cutting the firm's access to financing. Second, many trade creditors that appear as claim holders though bankruptcy filings also mention the bankruptcy of its client in their financial disclosures (in other words, they have an important enough exposure to the bankrupt firm to mention it, and yet they did not exit prior to the bankruptcy). To verify this last point we looked through 10-Q and 10-K filings of publically traded suppliers immediately following their customer's bankruptcy. We found that in roughly a quarter of bankruptcy cases, at least one supplier categorized as "informed" talks about the bankruptcy of its client in the financial statements.[11]

In sum, it seems unlikely that—in anticipation of bankruptcy—many suppliers cut their relationship all together. For the same reason, it seems unlikely that the firm is put into

[11] For examples: Unifi, Inc. (NYSE:UFI), "On July 2, 2007, Quaker Fabric Corporation ("Quaker Fabric"), a significant customer in the dyed business, announced that it had not met the requirements for committed borrowings under its existing lending facilities and that it would commence an orderly liquidation of its business and a sale of its assets." Textron Inc. (NYSE:TXT), "In May 2005, C&A and substantially all of its U.S. subsidiaries, including C&A Products Co. ("C&A Products"), filed for Chapter 11 bankruptcy protection […] These filings effectively reduced Textron's ability to seek recourse from C&A under the indemnity provisions of the purchase and sale agreement, should a default occur." Cardinal Health, Inc. (NYSE:CAH) following Brooklyn Hospital bankruptcy, "For fiscal year 2001, sales to customers that have filed for bankruptcy or that otherwise went out of business totaled approximately 4.9% of total revenues." La-Z-Boy Incorporated (NYSE:LZB) following Rhodes bankruptcy, "Some of our non La-Z-Boy branded operating margins were down due to a drop in sales volume, partially caused by the bankruptcies of two large customers."

bankruptcy because trade creditors do not rollover. Note that this does not mean that the terms of the credit do not get adjusted as the trade partner enters distress. In fact, more creditworthy buyers receive financing over longer maturities, but not in larger quantities (Klapper, Laeven and Rajan, 2011). So a shortening of maturity is quite plausible; this is also consistent with the compression of maturity of corporate debt in similar context modeled by He and Xiong (2012). This is not a problem for us, as it appears that most trade creditors are still caught holding bankrupt claims, and—at that point—their maturity is irrelevant. Furthermore, while term modifications could help suppliers influence the timing of bankruptcy or recovery rates, this is something that would benefit all trade creditors, and cannot explain the heterogeneity in trading behavior across different suppliers. Specifically, it could not explain why informed suppliers (recall that these are not necessarily the largest suppliers) sell their claims in bankruptcy ahead of realization of low recovery rates.

As mentioned earlier, our main measure of the supplier's information about the distressed debtor relies on the ratio of total receivables held by the supplier *j* against the bankrupt firm *i*, scaled by the supplier's total assets ($Trade\ credit_{ij}/Total\ assets_j$). By scaling by the size of the supplier, we implicitly assume that, as lenders, suppliers will extend credit to customers about whom they have the most information ex-ante, and will subsequently pay the most attention to these large trade-credit relationships. While $Trade\ credit_{ij}$ is available for all suppliers from bankruptcy filings, $Total\ assets_j$ is compiled from CapitalIQ and is available for 19% of suppliers. This is not surprising, since the sample of bankruptcies and suppliers is unconditional on the firm type, and the vast majority of the firms in the U.S. economy are private. In our analysis below, we show that the results hold if we just use the suppliers with financial information available. (Further, in this smaller sample, we show that controlling explicitly for the size or

liquidity of the supplier does not affect our results.) In our main results, we use all information on trade credit available in bankruptcy. When assets information is unavailable, we use an estimated value.

We start by estimating the following regression using the subset of suppliers with assets information:

$$\ln\left(\frac{Trade\ credit_{ij}}{Total\ assets_j}\right) = \alpha + \beta \ln\left(Trade\ credit_{ij}\right) + \gamma \ln(Total\ assets_i) + D_k + \varepsilon_{ij},$$

where *i* indexes the bankrupt firm, *j* indexes the supplier, and D_k are bankrupt-firm industry fixed effects. (We use logs of all values to avoid undue influence of outliers.) Note that on the right-hand side we are controlling for total assets of the bankrupt firm, not those of the supplier, in order to adjust for the fact that larger firms tend to have larger claims on average.[12] In Fig. 2, we display a binned scatterplot showing the relationship between $\ln\left(Trade\ credit_{ij}\right)$ and $\ln\left(\frac{Trade\ credit_{ij}}{Total\ assets_j}\right)$ after controlling for bankrupt firm size and industry for suppliers with balance sheet information. We find that this relationship is close to linear and tightly estimated across all values of $\ln\left(Trade\ credit_{ij}\right)$, which validates using these regression coefficients to estimate $\ln\left(\frac{Trade\ credit_{ij}}{Total\ assets_j}\right)$ for suppliers that are missing balance sheet information. In the analysis below, we refer to this variable as *Informed supplier*.[13]

[12] The results are robust to the exclusion of controls for the size of the bankrupt firm and industry fixed effects.

[13] In an earlier draft we used an alternative measure of *Informed supplier* define as an indicator variable equal to 1 for suppliers with above-median payables to total assets across our full sample of trade claims. This alternative definition assumed that firms for which we are unable to find balance sheet data are likely to be small. Under this assumption, if the claim amount of these creditors is above the 75th percentile in size, we classify them as an *Informed supplier*. All the core results in the paper hold with this discrete measure and not sensitive to using 60th or 80th percentile as a cut off. This demonstrates the robustness of the results and also helps us deal with the concern that the amount of trade credit might be endogenously changed leading to the bankruptcy filing, as most changes in trade credit amounts will not switch a firm from one category to another.

[FIGURE 2]

Finally, we note that, while *Informed supplier* is correlated with the size of the supplier: larger suppliers are less likely to be labeled as "informed". Fig. 3 shows that there is a significant overlap in the size distribution of the informed and uninformed groups of suppliers.

[FIGURE 3]

4. Trade creditors' information advantage

4.1. Public vs. private firms' reliance on trade credit

One of the virtues of our data is that it contains a complete list of suppliers and the payables that they hold against both public and private debtors. 68 (out of 132) firms in our sample are private. Contrary to the information advantage hypothesis, Petersen and Rajan (1997) find that smaller firms and private firms, which tend to be more opaque, were less likely to use trade credit. We reexamine this result in our sample and find support for the information advantage hypothesis. Unconditionally, trade claims account for 26.0% of total liabilities for private firms in our sample, while in public firms trade claims make up only 18.4% of total liabilities, a difference of 7.6 percentage points. Put differently, private firms' reliance on trade credit is 41% higher than that of public firms. In Table 3, Panel A, specification (1), we show that controlling for industry fixed effects increases this estimated difference to 10.3 percentage points, significant at the 1% level. In specification (2), we show that usage of trade credit is also strongly negatively related to firm size in our sample. Increasing firm size by one standard deviation is associated with a 5.8 percentage point reduction in trade claims as a fraction of total liabilities, a 26% decrease from the mean. Finally, in specification (3) we control jointly for the size and public or private status of the firm. Because the size of the firm and its public-private status are correlated, the magnitude and statistical significance of both coefficients are reduced, although both coefficients remain negative.

Specifically, the results suggest that the strongest driver of trade credit usage is firm size, whose coefficient is only slightly reduced from specification (3), and which remains statistically significant at the 10% level.

Panel B of Table 3 presents similar regressions, except in this case the dependent variable is the fraction of total liabilities accounted for by bank debt. The results are the mirror image of Panel A: public firms and larger firms in our sample rely on financial intermediaries much more heavily than private, smaller firms. Overall, these results are consistent with the information advantage hypothesis of trade credit: smaller firms and private firms appear to rely more heavily on trade credit and less on bank debt as a source of financing.

[TABLE 3]

4.2. Suppliers' in-bankruptcy trading behavior

Our central hypotheses look at the suppliers' trading behavior. First, if (either ex-post or ex-ante) private information is an important reason behind the decision to extend trade credit, then trade creditors should have insight on recovery rates. Thus, we expect to find that if the recovery rate is likely to be low, then the most informed suppliers would sell their stake in bankruptcy. Second, if the recovery is low, informed suppliers should lead the market by selling their stake first, before the low recovery is widely known by other market participants.

Our main result compares suppliers that decide to extend more or less credit as compared to their own capacity. Since these are big claims for the suppliers, their desire to sell the claims, and to do so quickly, might not be surprising, but—unless they are acting on private information—it should not predict low recovery rates. For a given bankruptcy case, a valid alternative explanation would need to explain a positive correlation between recovery rates and propensity of informed suppliers to sell their claims.

One such explanation is that suppliers who extend large amounts of trade credit might themselves be distressed (e.g., because they are in the same industry), and therefore they are forced to sell their claims for liquidity purposes exactly when their clients (the bankrupt firms) have low recovery rates. This highlights the importance of using *claim-level* recovery rates as the dependent variable, while controlling for *case-level* recoveries. Our hypothesis is that informed suppliers sell when the *claim-level* recovery rate is low for trade claims in particular, and thus we can control for overall *case-level* recovery rates, which should reflect the overall distress of the client firm. On the other hand, if the observable outcome is driven by the buyer's demand (e.g., if buyers look to purchase claims in low recovery cases in order to consolidate claims), it is not clear why potential buyers would primarily target the "informed" (and not simply the largest) suppliers' claims. Indeed, in unreported results we find that controlling for $Trade\ credit_{ij}/Total\ liabilities_i$ – the size of supplier j's claim compared to all liabilities in case i – does not affect our estimates.

The results for recovery rates are reported in Table 4. Each observation in the regression corresponds to an individual trade claim. To adjust for within-firm correlation, standard errors are clustered by bankruptcy. The dependent variable is the claim-level recovery rate. As described above, we focus on the recovery rate of trade claims (i.e., class-level recovery rate), rather than the overall recovery rate for the whole bankruptcy case since this is the relevant recovery that should affect the supplier's trading decision. As part of the Plan of Reorganization, different claimants are grouped into a few classes based on their seniority with each claimant class receiving a different recovery rate. Using the vote tabulations from the end of the bankruptcy case, we identify the voting class to which trade claims belong, which allows us to use the reported class-level recovery

rate as a key outcome variable in the analysis.[14,15] Throughout the analysis we control for the set of firm characteristics that previous research has been found to influence bankruptcy outcomes (Ivashina, Iverson, and Smith, 2016). This includes industry fixed effects, the size and profitability of the firm, and when the bankruptcy was filed. Asset size and earnings before interest, taxes, depreciation, and amortization (EBITDA) come from *The Deal Pipeline*. Positive EBITDA is a dummy variable indicating if the firm had positive EBITDA prior to filing. Only limited information is available for pre-bankruptcy EBITDA. To account for this, we control for the level effect for those firms that have EBITDA data available. *Economic recession* is a dummy equal to 1 if the firm files for bankruptcy during a recession period, as defined by National Bureau of Economic Research. We also control for whether the case was a prepackaged bankruptcy, how long the firm was in bankruptcy, and the ultimate outcome of the case (whether the firm was reorganized, sold, or liquidated piecemeal).

The first result that can be seen in Table 4 is that there is a positive coefficient on *Claim sold*, showing that, on average, suppliers sell their claims when recovery rates are higher. This is possibly because buyers are unwilling to purchase claims with low expected upside potential. The central explanatory variable of interest is *Informed supplier*, defined as the log of the ratio of total trade credit extended to the bankrupt firm over total supplier assets. Our focus is whether the informed suppliers, who are lending relatively large amounts to the bankrupt firms, use their informational advantage to sell when recovery rates are expected to be low. The interaction term between *Informed supplier* and *Claim sold* is thus the key independent variable. We find that sales

[14] In a typical bankruptcy case, trade credit is classified as a "general unsecured claim," placing it below senior bank debt and on par with junior unsecured public bonds in the seniority structure. In our sample, the average trade claimant receives a recovery of 34 cents on the dollar.

[15] We obtain the estimated recovery rates from bankruptcy Disclosure Statements which are filed in court with the Plan of Reorganization, i.e., toward the end of the bankruptcy and after most of the claims are sold.

by informed suppliers strongly predict lower recovery rates, with a one standard deviation increase in *Informed supplier* predicting 2.7-percentage-point lower recovery rates. This is a 5.1% reduction relative to the mean recovery rate of 52.5%.[16] In specification (2) we find that this result remains unchanged and significant at the 1% level when controlling for the case-level recovery rate, showing that informed suppliers use information specific to *their* recovery rate, rather than just overall knowledge of the firm-wide prospects, to know when to sell. In specification (3) we show that the result holds even when controlling for bankruptcy case fixed effects.[17]

[TABLE 4]

Because *Informed supplier* relies on using imputed values for suppliers without balance sheet information, in columns (4) and (5) we report additional results that focus only on the subsample of suppliers with information on total assets. We continue to find similar results using this subsample. Further, in column (4) we also control for *Ln(Supplier assets)* and the interaction between this variable and *Claim sold* to demonstrate that the predictive power of *Informed supplier* is not driven by the size of the supplier. In column (5), we similarly control for supplier liquidity by including *Supplier cash / assets ratio* and its interaction with *Claim sold*. This additional control does not affect our main finding. These additional tests help to rule out the alternative hypothesis, discussed above, that trading decisions by informed suppliers predict recovery rates because the suppliers themselves are also distressed. If this were the case, then controlling for the size and liquidity of the supplier would soak up the predictive power of *Informed supplier * Claim sold.*

[16] The unconditional mean recovery rate for all trade debt in our sample is 34.1%, while the recovery rate conditional on the claim being sold is 52.5%.

[17] Statistical power is substantially reduced when case fixed effects are included because there is limited within-case variation in trade creditor recovery rates. In our sample, 85% of all trade claims are in the same claimant class and receive the same recovery for the average case. In over 30% of our cases, all trade creditors receive the same recovery rate. Thus, it is unsurprising that the result is only significant at the 10% level (*p*-value of 0.052) in column (6).

The results in Table 4 focus on the intensive margin by comparing more and less informed trade creditors. Ideally, we would also examine suppliers' behavior as compared to financial intermediaries (the extensive margin). Rule 3001(e), however, does not require filing of transfers for bonds and syndicated loans. We try to get around this limitation by testing for heterogeneity in our effects across more and less opaque firms. The underlying assumption behind this analysis is that opaque firms should rely most heavily on informed lenders (since information asymmetries will increase the cost of capital obtained from uninformed lenders), and therefore these are also the cases in which informed trade creditors hold the largest information advantage. Because public firms are required to regularly disclose information about their financial performance, we proxy for firm opacity by using the public/private status of firms prior to entering bankruptcy. This is consistent with the discussion in Section 4.1. In addition, we look directly at firms that depend most heavily on trade credit by examining firms with high levels of trade credit relative to bank debt.

In column (1) of Table 5, we estimate a regression similar to those in Table 4 except we add a triple interaction term *Informed supplier * Claim sold * Private firm*, which tests whether sales by informed trade creditors are especially predictive of recovery rates for private firms. We find that the coefficient for private firms is significantly different than the estimate for public firms. Further, the economic magnitude of the differences is large, with a coefficient estimate of -0.015 for public firms and -0.048 (-0.015 - 0.033) for private firms. In column (2), we define bankrupt firms as *Heavy trade credit users* if they have an above-median ratio of total trade credit to bank loans at the time of bankruptcy. Similar to column (1), we find that sales by informed suppliers are significantly more predictive of recovery rates when the distressed firm is a heavy trade credit user, with a coefficient of -0.006 for light trade credit users and -0.033 for heavy trade credit users.

Although, the result in column (2) is not statistically significant at a conventional level if instead of the cut-off we use continuous measure of total trade credit to bank loans. Overall, results in Table 5 are consistent with informed trade creditors holding the largest information advantage for opaque firms. They add further to support to the analysis in Section 4.1, which shows that more opaque firms tend to rely more heavily on trade creditors as opposed to other financial intermediaries.

[TABLE 5]

For twenty bankruptcy cases we can observe the date when a supplier sells its payables, corresponding to a total of 282 trades. On all observables, this subsample of trades looks similar to other trades without dates; it appears that the decision to record the date of the trade by the data suppliers was idiosyncratic. In particular, *t*-tests for differences in the size of the claim between traded claims with dates and those without are insignificant, as are *t*-tests for differences in whether the claim is secured. Moreover, the cases for which we have recorded dates look similar to other cases in terms of firm size, overall recovery rate, the industry distribution, and reliance on trade credit. Based on this, we do not expect that focusing on this subsample introduces any particular bias in our estimates. For this sample, then, we can test whether suppliers that extend more trade credit to their partners (suppliers with more private information) anticipate recovery rates earlier than less-informed suppliers. If the recovery is low, informed suppliers should lead the market by selling their stake first. It is worth emphasizing that relationship-based theories of trade credit would predict exactly the opposite. We look at the time until the supplier sells its stake both in the absolute number of days since the beginning of the bankruptcy (Panel A of Table 6) and as a fraction of the total bankruptcy duration (Panel B of Table 6).

As before, the main explanatory variable in Table 6 is *Informed supplier*, which we interact with *Low recovery*. In columns (1) and (2), we split the 20 cases in this subsample by above-median recovery rates and below-median recovery rates, and identify the below-median firms as *Low recovery*. Meanwhile, in columns (3) and (4) we simply use the continuous claim-level recovery rate multiplied by -1 as *Low recovery*, where we multiply by negative one in order to keep the signs of the coefficients consistent across all columns. With this set-up, the interaction between *Informed supplier* and *Low recovery* tests whether informed suppliers lead the market in particular when recovery rates are low, while the coefficient on *Informed supplier* alone tests whether informed suppliers lead the market in high-recovery cases.

As seen in columns (1) and (2), in high recovery cases the time until sale for more informed suppliers is not appreciably different from that for less informed suppliers. In low recovery cases, however, informed suppliers are not only more likely to sell their stake (as shown previously), but they do so significantly earlier than less informed suppliers. Specification (2), which includes controls for other case characteristics, shows that a supplier that is one standard deviation more informed (an increase of *Informed supplier* by 1.51) sells their stake on average 2.9 months ahead of less informed suppliers in low-recovery cases, a result that is statistically significant at the 1% level. Given that the mean time to sale across all 282 trades is 8 months, these are economically meaningful lead times. Results using the continuous recovery rate in columns (3) and (4) show the same pattern: informed suppliers sell their claims earlier when recovery rates are lower. In the limit, these estimates show that suppliers who are one standard deviation higher by the *Informed supplier* measure sell their claims 3.6 months earlier when recovery rates are zero, relative to a

case with a 100% recovery rate. In addition, in Panel B we find very similar results if we instead define the time until sale as a fraction of the total time in bankruptcy.[18]

[TABLE 6]

From a legal standpoint, whether a supplier continues to do business with the debtor or not has no effect on the treatment of the pre-bankruptcy claims. That is, all trade claims are typically grouped together in the same claimant class, and thus receive the same recovery regardless of whether an individual supplier has sold their claim or not. Thus, the post-bankruptcy relationship between the supplier and customer is unlikely to have any bearing on the expected recovery rate or treatment of the pre-bankruptcy claims and, therefore, should not affect the decision to sell. Nevertheless, a supplier's decision to continue to hold its claims could be driven not only by its information advantage but also by its existing relationship with the bankrupt firm. Due to an ongoing relationship, the suppliers implicitly hold a stake in the survival of the company, and therefore might be unlikely to sell. Wilner (2000) hypothesizes that in such cases trade creditors would be likely to grant concessions in the restructuring process. The results in Table 4 show that large trade creditors are likely to hold their claims when the claim-level recovery is higher, which goes against this hypothesis. More generally, if trade creditors are trying to preserve a relationship, they would be unlikely to sell their claims when the company is more likely to survive as a going concern, especially if they can use their stake to affect the bankruptcy outcome. In Table 7 we examine whether this is the case.

Each observation in Table 7 represents an individual bankruptcy case. We first examine the relationship between informed trading and the duration of the bankruptcy case (specification

[18] The mean bankruptcy duration in this subsample is 22.5 months. Thus, results in specification (2) in Panel B of Table 6 suggest that suppliers that are one standard deviation more informed lead less-informed suppliers in low-recovery cases by 2.6 months.

(1)). The main explanatory variable is *Share of informed claims that are sold*, defined as the percentage of claims owned by informed suppliers that are sold in bankruptcy. In order to create this variable, we rely on the binary version of *Informed supplier* described at the end of Section 3 to categorize trade creditors. Importantly, we include as a control the total share of trade claims that are sold, thereby focusing on informed selling in particular. After controlling for other case-level characteristics, we find a positive relationship between informed selling and the length of the bankruptcy case, as one would expect if informed suppliers sell when the bankruptcy will last a long time, but the relationship is statistically insignificant (*p*-value of 0.149).

Specifications (2) – (4) in Table 7 show the relationship between informed selling and the bankruptcy outcome. To gather information on the evolution of each bankruptcy case, we rely primarily on *The Deal Pipeline*'s Bankruptcy Insider archive and the bankruptcy Disclosure Statements. Following Ivashina, Iverson and Smith (2016), we classify each bankruptcy outcome into one of three categories: (i) a traditional "reorganization," in which a firm exits Chapter 11 intact as a free-standing entity (45% of the cases), (ii) a sale of the firm as an independent going concern to a financial or strategic buyer (10% and 12% of the cases, respectively), and (3) a liquidation of the firm's assets so that no primary going concern remains at the end of the case (33% of the cases). When a higher share of informed suppliers sell their claims, cases are substantially more likely to be sold rather than reorganized. Companies whose bankruptcies have a one standard deviation higher share of informed sellers (17.9% more informed claims sold) are 5.9% more likely to be sold (a 26.8% increase from the mean), with a corresponding decrease in the companies' propensity to be reorganized. Sales of informed claims are not associated with a higher or lower likelihood of liquidation, however.

In interpreting these results, we note that our findings are not necessarily causal. Informed suppliers could directly affect the outcomes of bankruptcy cases by granting concessions (which could speed up bankruptcy proceedings) and bargaining for the firm to be reorganized in order to preserve their relationship with the firm, as argued in Wilner (2000). The results in Table 7 are in line with this interpretation. It could also be, however, that informed suppliers simply have better information about the likely outcome of the bankruptcy, and they use that information to sell their claims when it makes the most sense: when their relationship with the firm is likely to be terminated. In that case, the suppliers are not necessarily affecting the outcomes of the cases, but simply using their information about the likely outcome for their benefit. Our results do not differentiate between these two theories.

[TABLE 7]

5. Channels of information transfer

The results in the previous section give evidence that large trade creditors hold an information advantage on the recovery rates of the bankruptcies in our sample. In this section we examine the channel through which trade creditors receive their information advantage.

Previous papers (Petersen and Rajan, 2002; Mian, 2006; and Sufi 2007) have shown that geographic distance between banks and borrowers can create frictions in transferring soft information. While changes in information technology have diminished the importance of local banks (Petersen and Rajan, 2002), suppliers continue to be naturally located nearby due to transportation costs, shared labor markets, and other benefits of agglomeration. As such, the geographic distance between trade partners is a natural channel through which suppliers might hold an information advantage over financial intermediaries.

We provide direct evidence that trade creditors in our sample lend over shorter distances than financial intermediaries in Table 8. In this table, we first use the address of each creditor in our database to calculate the distance between the creditor and the debtor, using the Haversine formula.[19] Next, we categorize all creditors in our sample into one of 5 institutional types, following Ivashina, Iverson, and Smith (2016): (i) "trade creditors," identified as holdings by non-financial corporations, (ii) "banks," which include both commercial and investment banks and their subsidiaries, (iii) "active investors," which include holdings identified positively to be hedge funds and private equity (PE) funds, as well as creditors with keywords in their name that suggest they are an asset management fund or firm, (iv) "other financial" institutions, including insurance and real estate firms, and (v) "miscellaneous" claims, which include those owned by individuals or the government.[20]

Table 8 shows that the median trade creditor in our sample is 452 miles from the debtor, while the median bank is 637 miles away. Even more striking is the finding that 42.5% of all trade creditors are located within 200 miles of the debtor, while the similar figure for banks is only 6.9%. Indeed, across all lender categories, trade creditors have the highest share located within 200 miles.[21]

One difficulty in measuring distances between debtors and creditors is that we have the location of the headquarters of each entity, but each firm may have multiple locations. Our underlying assumption in using the distance between headquarters is that lending decisions are

[19] We use the address of the main headquarters of each institution for those that we were able to match to *CapitalIQ*. For those that we were not able to match, we use the address found on the Schedules of Assets and Liabilities.

[20] We do not report distances for bondholders because we only observe the location of the custodial bank, not the ultimate bondholder.

[21] An interesting observation is that active investors, with a median distance of 486 miles and 38.6% of lenders within 200 miles, tend to be located nearly as close as trade creditors. However, active investors make up a much smaller portion of the capital structure than trade creditors.

made at headquarters rather than a satellite location such as a warehouse or bank branch. For instance, while a supplier may use a local warehouse to distribute goods, the decision to extend trade credit is not likely made at that warehouse.

It is plausible, however, that some lending decisions are not made at headquarters, making headquarter-to-headquarter distance a noisy proxy for our purposes. Note that among large trade creditors the headquarters-to-headquarters distance is, if anything, biased upwards since suppliers with multiple locations may use a closer location than headquarters to gather information. To understand this issue more fully, we include in Table 8 summary statistics of distances between bankrupt firms and their suppliers when limiting only to suppliers not found in CapitalIQ. These suppliers are likely to be smaller and have fewer locations, making the distance between headquarters a better proxy. We find that the median distance between trade creditor and debtor in this subsample (520 miles) is slightly larger than the full sample, and 36.2% of suppliers are within 200 miles. These distances are still smaller than those between debtor firms and banks in our sample.

Similarly, banks may have multiple branches. In Table 8, we show distance summary statistics for banks with below-median total lending in our sample, again with the intuition that smaller banks will have less-dispersed networks and so the distance to headquarters is a more precise proxy. As hypothesized by Stein (2002), we find that distances are smaller for small banks, with 21.1% of the lending by below-median banks being within 200 miles, vs. 6.9% for the full sample. However, the key takeaway remains: many trade creditors tend to be located closer to their customers than banks. In fact, these differences in median distances and share of lenders within 200 miles are statistically significant at the 1% level both in the full sample and when limiting to

smaller suppliers and banks. While banking has become more distant over time, a significant number of trade creditors remain quite local to the firms they lend to.

[TABLE 8]

Table 8 examines one channel of information transfer (distance) across institutional types. We now turn to the intensive margin and examine channels of information within trade creditors. In this analysis we continue to examine the role that geographic distance plays in information transfer, but we also test whether suppliers in related industries lend more. Financial intermediaries, by definition, are in dissimilar industries from the corporations they lend to. Trade creditors, on the other hand, are often in related industries, providing another channel through which they might hold an informational advantage.

We use two separate measures of industry similarity. The first, *industry distance*, is based on the hierarchy embedded in SIC. It is a discrete variable that ranges between 0 (most informed) and 4 (least informed). The measure corresponds to the number of identical first digits in the 4-digit SIC classification of the bankrupt firm and its trade partner; thus, trade partners with identical 4-digit SIC codes would receive a score of 0, while if they are only in the same 2-digit SIC code they would receive a score of 2. Trade partners that do not share even the first digit of the SIC code receive a score of 4. Second, we consider a classification based on the propensity of the two industries to belong to the same conglomerate, using the Compustat segments data. The basic idea is that if two companies are trade partners, and we also observe a conglomerate in the segments data that contains both industries of the trade partners, then those industries are likely related, making it easier for the supplier to be informed. Thus, *industries in same conglomerate*, is simply a dummy variable equal to 1 if we observe a conglomerate that contains both industries.

Table 9 tests whether suppliers who are geographically nearby or in similar industries are more likely to lend larger amounts (relative to their own size) to their trade partners. In these regressions, there is one observation per supplier per bankruptcy case, since the *Informed supplier* variable is defined at the supplier level.[22] Columns (1) - (3) show that suppliers that are nearby or in similar industries (by either measure) are significantly more likely to lend large amounts, controlling for the security of the loan as well as debtor characteristics. The effect persists for each measure when they are included simultaneously (column 4) and also when we include bankruptcy case fixed effects (column 5). Recalling that *Informed supplier* is $\ln\left(\frac{Trade\ credit_{ij}}{Total\ assets_j}\right)$, we can interpret the coefficient on $\ln(Miles\ between\ creditor\ and\ debtor)$ as an elasticity, so coefficients in column (5) suggest that a 1% increase in distance is associated with a 0.3% decrease in lending relative to the supplier's capacity. Meanwhile, moving 1 unit further in *Industry distance* (e.g., moving from the same 3-digit SIC code to the same 2-digit SIC code) is associated with a 6.2% reduction in trade credit relative to the supplier's size. Finally, suppliers that are in a similar industry by the conglomerate measure tend to lend 11.9% more than those in dissimilar industries.[23]

[TABLE 9]

6. Concluding remarks

There are several theories that explain why trade credit is such a prominent source of financing. One strand of literature suggests that suppliers have an advantage in resolving

[22] Regressions in Tables 4 through 6 have observations at the individual claim level, since a supplier could sell one claim but keep another.

[23] In unreported results, we run similar regressions with the dependent variable being the continuous measure ln(total claims amount) rather than the dummy variable *informed supplier*. Consistent with Table 9, we find that suppliers who are geographically close or in similar industries tend to lend significantly more to their trade partners.

informational frictions about the debtor, but empirical work has found little support for this hypothesis. We revisit this question using a detailed data set on 132 bankrupt firms. By focusing on firms in bankruptcy, we overcome two obstacles that have hindered empirical work on trade credit in the past. First, complete data on trade credit relationships is not broadly available. However, bankrupt firms are required to disclose all liabilities at the bankruptcy filing, thereby allowing us to observe each individual trade credit contract for both public and private firms. Second, it is difficult to empirically distinguish between the several theories that rationalize the existence and prevalence of trade credit because these theories are not mutually exclusive. The bankruptcy setting allows us to focus on the informational hypothesis because we observe clear ex-post outcomes (trading behavior and recovery rates).

While trade credit makes up a significant portion of total liabilities for essentially all firms in our sample, which is consistent with other evidence, we also show that—contrary to other findings—smaller and private firms rely most heavily on trade credit. Our main insight uses information on in-bankruptcy trades by suppliers holding receivables of the distressed firms in our sample. We show that the propensity to sell claims by more informed suppliers—those that supply a large amount of trade credit relative to their own size—predicts lower recovery rates. Further, we hypothesize that this result should be the strongest for more opaque firms, where the information advantage of trade creditors is the highest. Consistent with this, we find that sales by informed suppliers are particularly predictive of low recovery rates for distressed firms that are private and those that rely most heavily on trade credit as a source of financing. In addition, we also find that informed suppliers sell earlier than less-informed suppliers when recovery rates are lower.

Finally, we present evidence on the channel through which suppliers hold an informational advantage. Consistent with previous literature on information transfer and geographic distance, we show that trade creditors tend to be located closer than financial lenders. We also find that suppliers who are nearby or who are in similar industries, which we hypothesize should have a lower cost to obtaining information, are significantly more likely to lend large amounts to their clients.

While there are several reasons why trade credit relationships might exist ex ante, once the firm has filed for bankruptcy, a suppliers' decision to sell its claim should only be directly affected by its private information and desire to continue the strategic relationship after bankruptcy. Thus, this paper is not testing between these different hypotheses, but rather makes the case that—holding other aspects fixed—suppliers hold an informational advantage over other potential lenders.

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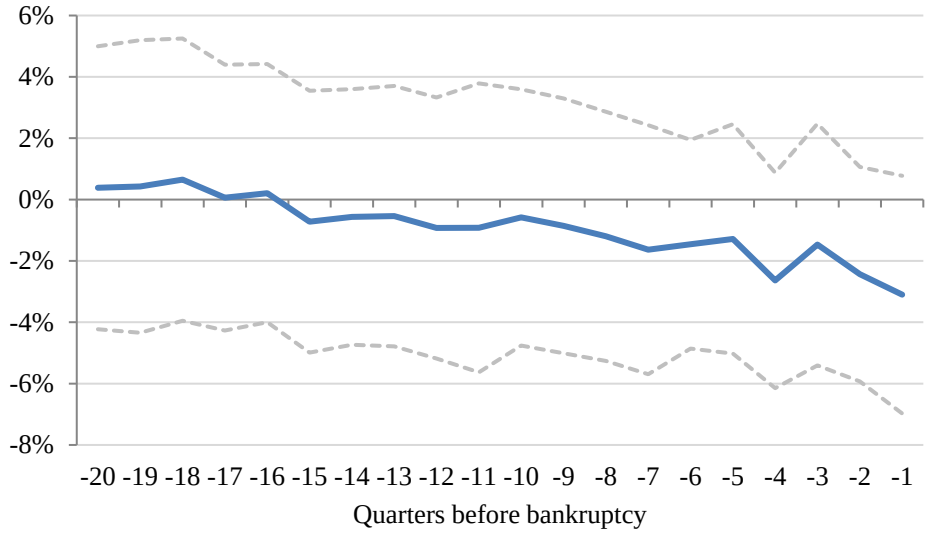
Fig. 1. Trade credit usage before bankruptcy.

These figures show how reliance on trade credit evolves in the 5 years leading to the bankruptcy. The sample consists of 72 public firms. The chart displays the mean deviation from the industry (3-digit SIC) average in Compustat. Dotted lines are 95% confidence intervals.

Panel A: Accounts payable / Total liabilities



Panel B: Accounts payable / Cost of goods sold

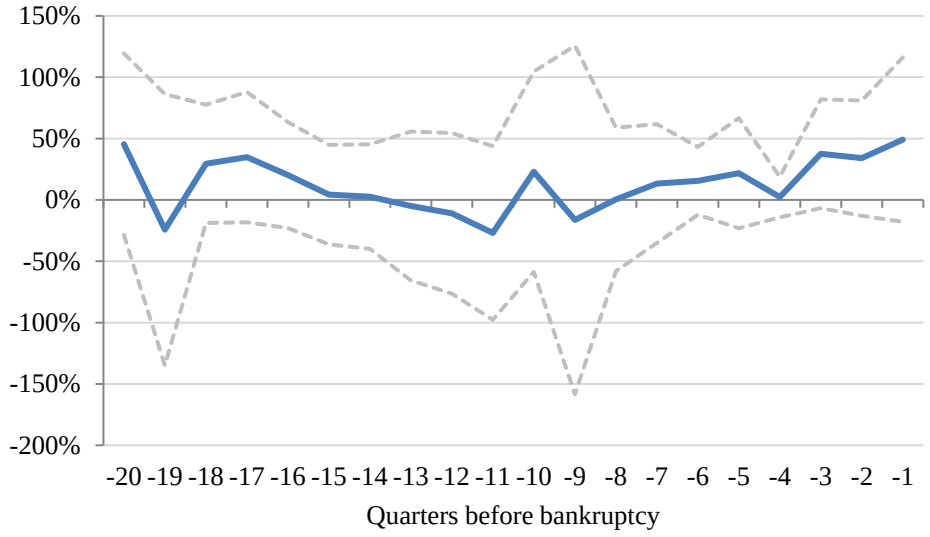


Fig. 2. Using total trade credit extended to predict *Informed supplier*.

Because supplier balance sheet information is often not available, we use fitted values of *ln*(*Trade Credit / Total assets)* for those suppliers that are missing information, from estimating:

$$\ln\left(\frac{Trade\ credit_{ij}}{Total\ assets_j}\right) = \alpha + \beta \ln(Trade\ credit_{ij}) + \gamma \ln(Total\ assets_i) + D_k + \varepsilon_{ij}\ ,$$

where *i* corresponds to the bankrupt firm, *j* corresponds to the supplier, and D_k are bankrupt-firm industry fixed effects. *Total assets* are measured as of the fiscal year preceding the bankruptcy. The figure displays a standard binned scatterplot (each point corresponds to bin's average) showing the relationship between *ln*(*Trade credit / Total assets)* and *ln(Trade credit),* after residualizing each variable with respect to the natural logarithm of debtor's assets and industry fixed effects.

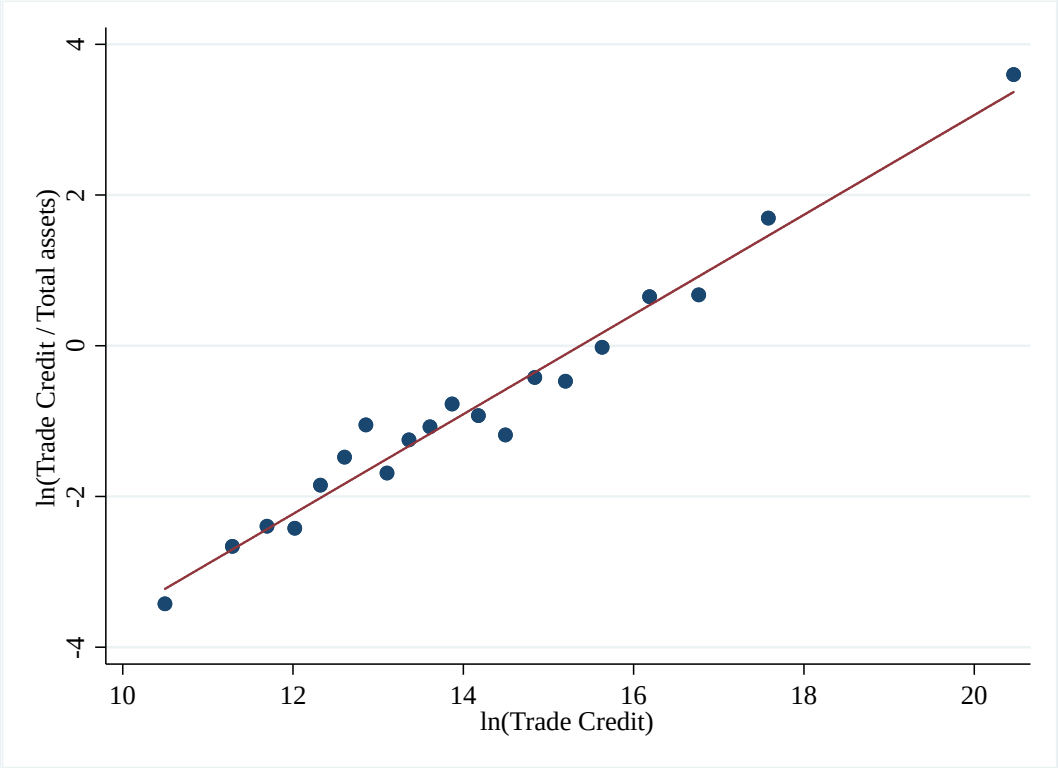


Fig. 3. Distribution of supplier size by *Informed supplier* measure.

This figure displays kernel density plots of the size distribution of trade creditors split by our discrete measure of whether the supplier is informed or not. The *x*-axis displays the log of total assets as of the year before the trade partner filed for bankruptcy. The sample is constrained to suppliers with asset-size information in CapitalIQ.

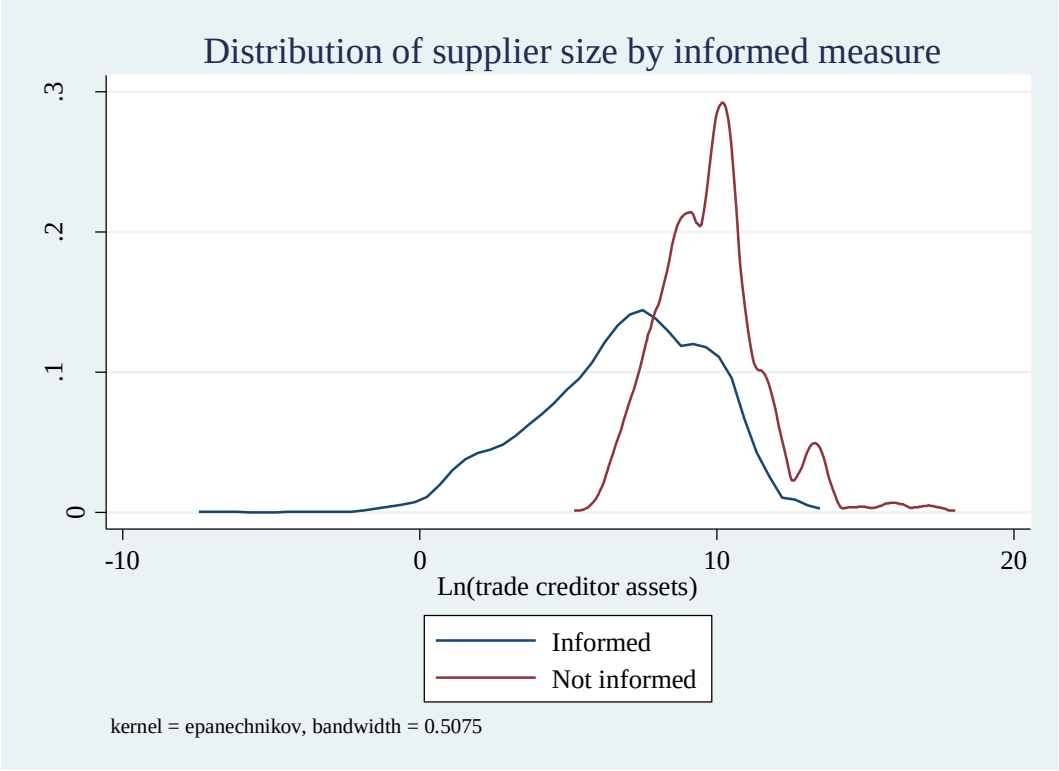


Table 1

Description of firms filing for Chapter 11 bankruptcy.

Panel A of this table summarizes characteristics of the 132 bankrupt firms with in-bankruptcy trading data, and compares these characteristics to the sample of bankrupt firms drawn from the *UCLA-Lopucki Bankruptcy Research Database* (*BRD*), which represents all firms that file for bankruptcy during the 1998-2009 period that are in Compustat and have assets at the time of filing greater than $100 million in 1980 dollars (about $280 million in current dollars). Panel B reports pre-bankruptcy financial characteristics of the bankrupt firms, based on data collected from *The Deal Pipeline*, Compustat, CapitalIQ, and Chapter 11 disclosure statements.

Panel A: Sample distribution

	Our Sample	UCLA-LoPucki BRD
By year of filing:		
1998	0.8%	5.2%
2000	0.8%	12.9%
2001	6.0%	16.2%
2002	9.9%	13.6%
2003	12.1%	9.5%
2004	6.8%	4.9%
2005	12.1%	4.2%
2006	13.6%	2.3%
2007	9.1%	2.2%
2008	23.5%	6.5%
2009	5.3%	15.2%
By restructuring outcome:		
Reorganized	44.7%	--
Sold to a financial buyer	9.9%	--
Sold to a strategic buyer	12.1%	--
Liquidated piecemeal	33.3%	28.8%
By filing type:		
Traditional “free-fall” Ch. 11	79.2%	71.9%
Prearranged Ch. 11	18.5%	21.1%
Tort-related Ch. 11	2.3%	7.0%

Table 1 (cont.)

Panel B: Firm characteristics

		Our sample				UCLA-Lopucki BRD			
	Source	Obs.	Mean	Std. dev.	Median	Obs.	Mean	Std. dev.	Median
Pre-bankruptcy EBITDA (million $US)	Compustat	57	177	626	23	534	177	2,108	30
Pre-bankruptcy employees	SDC	69	6,901	11,908	2,100	598	7,825	19,505	2,847
Pre-bankruptcy total debt (million $US)	Capital IQ	64	1,947.1	3,732.5	422.3	--	--	--	--
Bank debt (%)	Capital IQ	56	41.41%	33.52%	36.50%	--	--	--	--
Secured debt (%)	Capital IQ	53	60.31%	38.13%	62.16%	--	--	--	--
Long term debt (%)	Capital IQ	44	64.47%	36.19%	81.81%	--	--	--	--
Total assets at filing (million $US)	Deal Pipeline	129	1,967	4,911	250	442	4,372	31,643	559
Total liabilities at filing (million $US)	Deal Pipeline	129	1,850	4,359	372	396	4,626	32,532	603
Total liabilities/Total assets (no outliers)	Deal Pipeline	126	1.49	1.42	1.06	392	1.27	1.40	0.98

Table 2

Average share of trade claims held by each industry type, weighted by value of claims.

This table compares the distribution of suppliers across the industries in our sample and in the U.S. economy in aggregate as reported by the U.S. Bureau of Economic Analysis. To focus explicitly on trade credit relationships, the input-output figures from the BEA have been adjusted to reflect the industry distribution after excluding financials and governmental agencies.

	Obs.	Mining & Construction	Manufacturing	Transportation, Communications, and Utilities	Wholesale & Retail Trade	Services	Other
Debtor Industry:		Supplier industry in our data					
Mining & Construction	7	22.4%	17.9%	16.4%	15.7%	26.8%	0.8%
Manufacturing	49	4.2%	45.2%	12.8%	17.5%	18.8%	1.5%
Transportation, Communications, and Utilities	20	3.4%	20.0%	44.3%	7.6%	24.4%	0.3%
Wholesale & Retail Trade	27	3.4%	29.2%	7.8%	34.2%	20.5%	4.9%
Finance, Insurance, and Real Estate	11	17.1%	7.3%	5.3%	4.6%	65.0%	0.7%
Services	14	5.8%	15.9%	8.2%	21.7%	47.8%	0.6%
		Supplier industry from input-output tables (Source: U.S. Bureau of Economic Analysis)					
Mining & Construction	--	14.3%	43.1%	8.4%	9.4%	24.2%	0.5%
Manufacturing	--	14.7%	50.8%	6.6%	7.6%	11.8%	8.4%
Transportation, Communications, and Utilities	--	26.0%	19.6%	24.3%	2.6%	23.4%	4.0%
Wholesale & Retail Trade	--	1.3%	16.4%	20.1%	10.3%	47.1%	4.9%
Finance, Insurance, and Real Estate	--	6.6%	9.3%	13.0%	3.2%	63.8%	4.2%
Services	--	1.8%	29.2%	12.7%	5.4%	47.9%	3.0%

Table 3
Reliance on trade credit and bank debt: private vs. public firms.

This table examines the reliance on trade credit (Panel A) and bank debt (Panel B) in the cross section of bankruptcies in our sample. 68 (out of 132) firms in our sample are private. Assets and industry information is from *The Deal Pipeline*. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Reliance on trade credit

Dependent variable:	Trade credit share of total claims		
	(1)	(2)	(3)
Public firm	-0.103***	--	-0.059
	(0.039)		(0.042)
Ln(Assets)	--	-0.026**	-0.020*
		(0.011)	(0.012)
Industry fixed effect	Yes	Yes	Yes
Observations	132	129	129
R-squared	0.096	0.114	0.128

Panel B: Reliance on bank debt

Dependent variable:	Bank debt share of total claims		
	(1)	(2)	(3)
Public firm	0.084*	--	0.031
	(0.044)		(0.052)
Ln(Assets)	--	0.027***	0.024**
		(0.007)	(0.009)
Industry fixed effect	Yes	Yes	Yes
Observations	132	129	129
R-squared	0.053	0.100	0.103

Table 4
Creditors' trading decision and recovery rates.

Each observation in the regression corresponds to an individual trade claim. Central explanatory variable is *Informed supplier*, defined as the log of payables to total supplier assets. We are specifically interested in whether the informed suppliers' differential propensity to sell (the interaction term between *Informed supplier* and *Claim sold*) predicts a low recovery rate. All columns except column (3) contain a set of bankruptcy case controls including: the natural logarithm of firm's assets prior to filing; a dummy variable indicating if the firm had positive EBITDA prior to filing, as well as an indicator for firms that did not have pre-bankruptcy EBITDA information available; a dummy equal to 1 if the firm files for bankruptcy during a recession period, as defined by National Bureau of Economic Research; the log of the number of days the firm was in bankruptcy; and dummies indicating if the firm was reorganized or sold. Column (3) includes bankruptcy case fixed effects in lieu of these controls. Columns (4) and (5) limit the sample to suppliers for which balance sheet information is available, and include further controls for the size (column 4) and liquidity (column 5) of suppliers. Precise definitions of *Informed supplier* and control variables are given in the text. Robust standard errors clustered at the bankruptcy case level are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4 (cont.)

Dependent variable:	Claim-level recovery rate				
	Full sample			Suppliers with assets data	
	(1)	(2)	(3)	(4)	(5)
Claim sold	0.090**	0.042**	-0.002	0.009	0.018
	(0.038)	(0.021)	(0.008)	(0.035)	(0.023)
Informed supplier	0.009	0.009	0.005	0.009	0.006
	(0.006)	(0.006)	(0.004)	(0.006)	(0.005)
Informed supplier * Claim sold	-0.018**	-0.018***	-0.009**	-0.013**	-0.013*
	(0.008)	(0.007)	(0.004)	(0.006)	(0.007)
Case-level recovery rate	--	0.506***	--	0.519***	0.518***
		(0.108)		(0.107)	(0.108)
Ln(Supplier assets)	--	--	--	-0.005**	--
				(0.002)	
Ln(Supplier assets) * Claim sold	--	--	--	0.001	--
				(0.004)	
Supplier cash / assets ratio	--	--	--	--	0.005
					(0.040)
Supplier cash / assets ratio * Claim sold	--	--	--	--	0.032
					(0.070)
Share of claim that is secured	0.604***	0.580***	0.616***	0.519***	0.518***
	(0.071)	(0.070)	(0.061)	(0.107)	(0.108)
Ln(Assets)	0.019	0.066***	--	0.050**	0.050**
	(0.018)	(0.021)		(0.021)	(0.021)
EBITDA data available	-0.194*	-0.229**	--	-0.186**	-0.187**
	(0.110)	(0.089)		(0.087)	(0.088)
Positive EBITDA	0.214*	0.198**	--	0.130	0.131
	(0.115)	(0.085)		(0.086)	(0.086)
Economic Recession	-0.011	0.041	--	0.002	0.002
	(0.079)	(0.068)		(0.072)	(0.072)
Prepackaged bankruptcy	0.382***	0.351***	--	0.352***	0.354***
	(0.108)	(0.112)		(0.119)	(0.120)
Ln(days in bankruptcy)	0.218***	0.170***	--	0.257***	0.258***
	(0.071)	(0.060)		(0.056)	(0.057)
Bankruptcy outcome: reorganized	-0.046	-0.158*	--	-0.057	-0.057
	(0.073)	(0.080)		(0.082)	(0.083)
Bankruptcy outcome: sold	-0.118	-0.126*	--	-0.059	-0.059
	(0.072)	(0.069)		(0.072)	(0.072)
Fixed effects					
Industry	Yes	Yes	--	Yes	Yes
Bankruptcy case	--	--	Yes	--	--
Observations	23,173	22,862	23,703	4,162	4,162
R-squared	0.518	0.620	0.524	0.648	0.646

Table 5
Creditors' trading decisions for informationally opaque firms.

The results in this table extend the analysis in Table 4 by including variables that measure firms' informational opaqueness. As before, each observation in the regression corresponds to an individual trade claim. *Informed supplier* is defined as the log of payables to total assets. In column (1), we proxy for informational opacity by focusing on private firms. The central explanatory variable is the triple interaction term *Informed supplier * Claim sold * Private firm*, which tests whether informed suppliers' trading decisions are especially predictive of recovery rates for private firms. Column (2) is similar, but instead focuses *Heavy trade credit users*, defined as distressed firms with above-median amounts of trade credit relative to bank loans. All control variables are identical to Table 4, column (1) and are defined in the text. Robust standard errors are clustered at the bankruptcy case level and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable:	Claim-level recovery rate	
	(1)	(2)
Claim sold	0.102**	0.041
	(0.047)	(0.032)
Informed supplier	0.014	0.014
	(0.010)	(0.010)
Informed supplier * Claim sold	-0.015	-0.006
	(0.010)	(0.008)
Informed supplier * Claim sold * Private firm	-0.033**	--
	(0.015)	
Informed supplier * Claim sold * Heavy trade credit user		-0.027***
		(0.010)
Private firm	-0.076	--
	(0.054)	
Informed supplier * Private firm	-0.017	--
	(0.013)	
Claim sold * Private firm	-0.072	--
	(0.063)	
Heavy trade credit user	--	1.411
		(0.863)
Informed supplier * Heavy trade credit user	--	-0.015
		(0.010)
Claim sold * Heavy trade credit user	--	-0.018
		(0.042)
Case-level controls in Table 4, column 1	Yes	Yes
Industry fixed effects	Yes	Yes
Observations	23,173	23,173
R-squared	0.522	0.631

Table 6

Timing of the supplier's exit.

The analysis in this table is focused on trades where we observe the transaction date. In Panel A, the dependent variable is the number of days between the bankruptcy filing and the date of the trade. In Panel B, the dependent variable is defined as days until trade scaled by the total length of the bankruptcy. As before, the central explanatory variable is *Informed supplier*, defined as the log of payables to supplier's total assets. In this table, the focus is on the interaction term between *Informed supplier* and *Low recovery*, which tests whether informed suppliers lead the market by selling earlier when recovery rates are low. We use two definitions of *Low recovery*: in columns (1) – (2), *Low recovery* is a dummy equal to 1 if the claim-level recovery rate is below the median across all trade credit claims in our sample; in columns (3) – (4), we use the continuous claim-level recovery rate multiplied by -1 so that it identifies cases with low recovery rates, yielding negative coefficients consistent with the first two columns. *Ln(Assets)* is the natural logarithm of firm's assets prior to filing. *Positive EBITDA* is a dummy variable indicating if the firm had positive EBITDA prior to filing. Only limited information is available for pre-bankruptcy EBITDA. To account for this, we control for the level effect for those firms that have EBITDA data available. *Economic recession* is a dummy equal to 1 if the firm files for bankruptcy during a recession period, as defined by National Bureau of Economic Research. Robust standard errors are clustered by bankruptcy and reported in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Days until sale

Claim-level recovery rate definition:	1 if < median, 0 otherwise		Continuous measure	
	(1)	(2)	(3)	(4)
Informed supplier	4.079	7.462	-85.939*	-62.815***
	(9.377)	(4.574)	(47.660)	(19.410)
Informed supplier * Low recovery	-52.218	-58.972***	-95.624*	-72.945***
	(36.686)	(16.004)	(48.746)	(20.056)
Low recovery	112.507	-35.790	75.957	-1.566
	(97.374)	(88.509)	(109.586)	(134.413)
Months in bankruptcy	--	22.954***	--	22.469***
		(7.032)		(7.219)
Ln(Assets)	--	-81.051**	--	-74.594**
		(29.768)		(30.547)
EBITDA data available	--	73.184	--	54.923
		(88.711)		(93.696)
Positive EBITDA	--	175.046	--	176.154
		(123.381)		(140.588)
Economic Recession	--	-73.099	--	-77.751
		(92.388)		(84.327)
Observations	282	280	282	280
R-squared	0.196	0.609	0.161	0.603

Table 6 (cont.)

Panel B: Fraction of bankruptcy duration until sale

Claim-level recovery rate definition:	1 if < median, 0 otherwise		Continuous measure	
	(1)	(2)	(3)	(4)
Informed supplier	0.000	0.010*	-0.139***	-0.077**
	(0.015)	(0.006)	(0.047)	(0.028)
Informed supplier * Low recovery	-0.083**	-0.079***	-0.147***	-0.091***
	(0.037)	(0.025)	(0.049)	(0.028)
Low recovery	0.165	-0.081	0.170	-0.100
	(0.109)	(0.112)	(0.119)	(0.192)
Months in bankruptcy	--	0.020*	--	0.020*
		(0.009)		(0.010)
Ln(Assets)	--	-0.144***	--	-0.141***
		(0.039)		(0.040)
EBITDA data available	--	0.091	--	0.076
		(0.130)		(0.131)
Positive EBITDA	--	0.287*	--	0.272
		(0.165)		(0.182)
Economic Recession	--	-0.162	--	-0.174
		(0.117)		(0.107)
Observations	282	280	282	280
R-squared	0.244	0.606	0.256	0.599

Table 7

Bankruptcy outcome and creditors' trading decision.

Each observation in the regression corresponds to a bankruptcy case. The dependent variable is the number of months in bankruptcy in specification (1), and dummy variables indicating the outcome the case (reorganized, sold, or liquidated) in specifications (2) – (4). The central explanatory variable is *Share of informed claims that are sold*, defined as the percentage of total claims held by informed suppliers that are sold during bankruptcy. Informed suppliers are defined as having an above median payables-to-assets ratio when balance sheet information is available, or total payables above the 75th percentile when the balance sheet is unavailable. *Share of total trade claims that are sold* controls for the overall percentage of trade claims sold during the case. Some of our cases have no suppliers defined as "informed." We set *share of informed claims that are sold* equal to zero for these cases and also control for the level effect with the dummy variable *no informed claims. Positive EBITDA* is a dummy variable indicating if the firm had positive EBITDA prior to filing. Only limited information is available for pre-bankruptcy EBITDA. To account for this, we control for the level effect for those firms that have EBITDA data available. *Economic recession* is a dummy equal to 1 if the firm files for bankruptcy during a recession period, as defined by National Bureau of Economic Research. Robust standard errors are clustered at the industry level and are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable:	Months in bankruptcy	Bankruptcy outcome:		
		Reorganized	Sale	Liquidation
	(1)	(2)	(3)	(4)
Share of informed claims that are sold	32.459	-0.346*	0.330***	0.017
	(19.065)	(0.149)	(0.073)	(0.186)
Share of total trade claims that are sold	-24.972	0.376	0.316	-0.691
	(25.430)	(0.516)	(0.589)	(0.528)
No informed claims dummy	-1.154	-0.196	0.334	-0.138
	(4.211)	(0.336)	(0.340)	(0.092)
Case-level recovery rate	6.389	0.339**	-0.039	-0.300
	(6.217)	(0.084)	(0.155)	(0.154)
Prepackaged bankruptcy	-15.729***	0.272**	0.122	-0.393***
	(3.800)	(0.089)	(0.137)	(0.087)
Ln(Assets)	1.417	0.073***	-0.015	-0.058**
	(1.057)	(0.012)	(0.013)	(0.020)
EBITDA data available	-5.307*	-0.143	0.081	0.062
	(2.432)	(0.107)	(0.089)	(0.113)
Positive EBITDA	8.659	0.298**	-0.120	-0.178
	(5.580)	(0.086)	(0.184)	(0.181)
Economic recession	0.144	0.132	-0.147	0.015
	(4.320)	(0.129)	(0.102)	(0.094)
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	114	114	114	114
R-squared	0.251	0.283	0.106	0.254

Table 8

Distance between creditors and debtors by institutional type.

This table shows the value-weighted distance between various creditor types and the bankrupt debtors in our sample. For each creditor in our dataset, we geocode the address of the creditor's headquarters (when available in *CapitalIQ*) or the address reported in the Schedules of Assets and Liabilities. We then use the Haversine formula to calculate the distance between each creditor and debtor. The table reports the value-weighted mean, median, and share of claims that are less than 200 miles away for each of the 5 institutional types: (i) trade creditors, which include all nonfinancial firms; (ii) banks, including commercial and investment banks and their subsidiaries; (iii) active investors, containing asset management firms, hedge funds, and private equity funds; (iv) other financial creditors, such as real estate or insurance firms; (v) and miscellaneous creditors, including government entities and individuals. Bondholders are omitted from the table because we only observe the location of the custodian bank for these claims. We also remove "insider claims," which are owned by other subsidiaries of the bankrupt company.

Creditor type	Obs.	Aggregate value of debt ($ billions)	Distance (miles)		% < 200 miles away
			Mean	Median	
All trade creditors	21,102	93.0	773	452	42.5%
Trade creditors not in CIQ	16,608	59.5	905	520	36.2%
All banks	2,265	145.9	737	637	6.9%
Banks below median total lending	1,004	17.3	623	749	21.1%
Active investors	663	3.9	609	486	38.6%
Other financial	4,194	5.8	674	581	10.9%
Miscellaneous	20,883	54.7	647	404	10.1%
Total	49,107	303.2	729	548	18.9%

Table 9

Determinants of amount lent by suppliers.

Each observation in these regressions corresponds to a trade creditor-debtor pair. The dependent variable is the *Informed supplier* used in Tables 4 – 6, defined as the log of payables to total assets of the supplier. *Ln(Miles between creditor and debtor)* measures the log distance between the supplier's headquarters and the bankrupt firm's headquarters. *Industry distance (SIC)* measures the similarity of industries between the trade partners based on their SIC codes. Trade partners who share all 4 digits of their SIC codes receive a score of 0, those that share 3 digits receive a score of 1, and so forth. *Industries in same conglomerate* is an indicator variable equal to 1 if a conglomerate is observed in the Compustat segments data that contains the industries of both the supplier and client. *Share of claims that are secured* is the value-weighted share of each supplier's claims that are secured. The remaining control variables are identical to those used in Table 4 and are defined in the text. Robust standard errors clustered at the supplier level are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent variable:	Informed supplier				
	(1)	(2)	(3)	(4)	(5)
Ln(Miles between creditor and debtor)	-0.022***	--	--	-0.016*	-0.031***
	(0.008)			(0.009)	(0.009)
Industry distance (SIC)	--	-0.107***	--	-0.057***	-0.062***
		(0.017)		(0.021)	(0.021)
Industries in same conglomerate	--	--	0.210***	0.205***	0.119***
			(0.025)	(0.030)	(0.030)
Share of claims that are secured	0.717***	0.759***	0.762***	0.853***	0.821***
	(0.071)	(0.076)	(0.080)	(0.092)	(0.095)
Ln(Assets)	0.128***	0.116***	0.109***	0.127***	--
	(0.008)	(0.008)	(0.008)	(0.010)	
EBITDA data available	-0.063	-0.098***	-0.109***	-0.089*	--
	(0.043)	(0.032)	(0.034)	(0.047)	
Positive EBITDA	-0.061	-0.000	-0.002	-0.063	--
	(0.040)	(0.035)	(0.037)	(0.043)	
Economic recession	0.103***	0.095***	0.058*	0.049	--
	(0.037)	(0.030)	(0.032)	(0.040)	
Prepackaged bankruptcy	-0.135**	-0.184***	-0.177***	-0.143*	--
	(0.066)	(0.047)	(0.049)	(0.073)	
Ln(days in bankruptcy)	-0.003	0.027	-0.009	-0.062	--
	(0.035)	(0.026)	(0.028)	(0.038)	
Bankruptcy outcome: reorganized	-0.046	0.024	0.036	-0.058	--
	(0.037)	(0.032)	(0.034)	(0.042)	
Bankruptcy outcome: sold	0.184***	0.264***	0.200***	0.143***	--
	(0.043)	(0.037)	(0.039)	(0.049)	
Industry fixed effect	Yes	Yes	Yes	Yes	--
Bankruptcy case fixed effect	--	--	--	--	Yes
Observations	12,038	12,979	11,749	9,169	9,511
R-squared	0.136	0.146	0.143	0.152	0.187