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Trade Credit: Contract-Level Evidence Contradicts Current Theories*

Tore Ellingsen† Tor Jacobson‡ Erik von Schedvin§

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Abstract

We study 52 million trade credit contracts, issued by 51 suppliers over 9 years to about 199,000 unique customers. The data contain information on contract size, due dates, actual time to payment, and firm characteristics. Our empirical analysis contradicts the conventional view that trade credit is an inferior source of funding. Specifically, while we replicate the usual finding that payables are negatively related to customers' financial strength, our disaggregated data reveal that improvements in customers' financial conditions are primarily associated with a reduced value of input purchases rather than smaller trade credit usage. In fact, customers' financial conditions are unrelated to agreed contract duration and only modestly affect overdue payments. Moreover, the customer's size and share of the supplier's sales both have a positive impact on the due date. Overall, the evidence indicates that customers prefer trade credit over other available sources of funding and thus calls for a new theory of short-term finance.

Keywords: Trade credit; Credit contracts; Financing constraints

JEL: G32; G33

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1 Introduction

Why is trade credit so pervasive?[1] Input suppliers are not experts at evaluating credit risks, and due to their limited and undiversified assets they are often greatly harmed in case of default by major customers.[2] So, why has the supply of short-term credit to businesses not entirely been taken over by specialized and well-diversified financial intermediaries? In this paper, we shall not resolve the trade credit puzzle. To the contrary, we provide high-resolution evidence that the puzzle is even deeper than the existing literature acknowledges: Firms consistently prefer to take as much trade credit as possible, and perhaps most remarkably, firms that are financially weaker have more payables primarily because the value of their input purchases is larger—not because they delay payment more. These findings contradict most leading models of trade credit.

The prevalence of trade credit has inspired many theories.[3] However, there is a shortage of data that admit a detailed examination of the theories' predictions. Hitherto, the empirical literature has predominantly examined variation in balance-sheet measures of firms' trade credit issuance and usage,[4] and theorists have striven to provide mechanisms that give rise to these empirical patterns. But a snapshot of accounts receivable and payable contains only limited information. It aggregates transactions involving many different parties. And even for a given buyer-seller pair, the payable amount constitutes an amalgam of the value of goods and services traded on credit and the actual time that elapses before payment is made. Usually, neither the formally agreed contract duration nor the actual credit duration is observed by the researcher, who is frequently left with at least five possible interpretations of observed aggregate variation in trade credit: (i) variation in the volume of input purchases, (ii) variation in the fraction of inputs bought on credit, (iii) variation in contracted duration, (iv) variation in overdue pay-

[1] Accounts receivable and accounts payable constitute significant fractions of firms' balance-sheets—commonly in the range between ten and thirty percent of assets in modern economies—and roughly on par with firms' short-term bank funding. See, for example, Rajan and Zingales (1995), Giannetti (2003), and Cuñat and Garcia-Appendini (2012).

[2] The vulnerability of suppliers to customer defaults is a central issue in the recent macroeconomic literature on business cycle propagation. Kiyotaki and Moore (1997) is the seminal theoretical contribution; see Jacobson and von Schedvin (2015) for further references and an empirical analysis of the impact of customer failure on suppliers' propensity to fail in turn.

[3] We shall mention some of the major theories below. For a more extensive discussion, see Giannetti, Burkart, and Ellingsen (2011), Section II.

[4] See, for example, Petersen and Rajan (1997), Nilsen (2002), Fisman and Love (2003), Giannetti, Burkart, and Ellingsen (2011), Carbó-Valverde, Rodríguez-Fernández, and Udell (2012), Garcia-Appendini and Montoriol-Garriga (2012).

ment, (v) variation in payment within the contracted period (due to early payment discounts or other inducements). Clearly, such aggregate data cannot easily be used to discriminate between theories that focus on different transaction-level mechanisms.

The present study offers disaggregated data on all trade credit arrangements between 51 large Swedish suppliers and all their domestic corporate customers over a nine year period.[5] Our contract-level data set comprises more than 52 million invoices to around 199 thousand unique customers. We observe the date and volume of each transaction, the contracted due date, as well as the actual payment date. Moreover, we have precise information on supplier and customer identities, their balance sheet characteristics, and their credit ratings. The longitudinal and granular nature of the data enables us to rigorously study how the transacting parties' characteristics jointly relate to the contract features and the trade credit outcomes. By contrast, most previous empirical studies of trade credit have resorted to model either supply or demand in isolation, as matched supplier and customer data have not been available. Such separation is known to be problematic, since estimated supply factors are likely to be influenced by omitted demand factors, and vice versa. Another advantage with our data is that, thanks to its structure, we can mitigate the impact of endogenous matching and unobserved supplier characteristics by saturating our models using combinations, and interactions, of time-, supplier-, and customer-fixed effects.

Our original plan was to use the data to gauge the explanatory power of existing theories of trade credit, such as Smith (1987), Brennan, Maximovic, and Zechner (1988), Biais and Gollier (1997), Burkart and Ellingsen (2004), and Cuñat (2007). In particular, we wanted to understand the extent of to which financially troubled buyers can obtain credit from their suppliers as other funds dry up, and whether additional credit takes the form of later due dates or overdue payments. But as it turns out, data convey the following more radical message: These theories are misguided. They portray trade credit as a costly and inferior alternative to bank credit. The reality is that trade credit is typically preferred to bank credit, with the possible exception of overdue payments, which constitute only a minor fraction of payables.[6]

How do we arrive at the conclusion that trade credit is preferred to bank credit? Like many

[5] Some of the suppliers are not observed during all years.

[6] While similar views have been voiced before, not least by Ng, Smith, and Smith (1999), it is rarely reflected in theoretical models or econometric studies. The model of Daripa and Nilsen (2012) is a notable recent exception.

previous studies, we find that a strengthening of the customer's financial position is associated with a reduction in trade payables (henceforth, payables). Petersen and Rajan (1997) proposed the standard explanation for this finding, namely that trade credit is an expensive form of financing, at least at the margin. In order to take advantage of early payment discounts or related inducements, financially stronger customers exploit their access to cheaper sources of funds. But in our data set, there is no indication that agreed trade credit is ever costly, and the largest part of the reduction in payables that is associated with better financial conditions is associated by reduced input purchases, not by shorter credit duration. The preference for trade credit is also manifested in other ways. When a customer's business grows to constitute a greater fraction of the supplier's sales, average agreed contract duration increases. In other words, customers appear to use their market power to obtain longer trade credit periods. Likewise, larger firms tend to obtain somewhat longer credit, just as previously found by Klapper, Laeven, and Rajan (2013).

This is not to say that trade credit is always superior to bank credit in our data. The *overdue* part of payables also decreases when the customer's financial position improves. In other words, less solid, less profitable and more cash-strapped customers draw more credit from their suppliers by postponing repayments beyond the contracted due date. This finding supports Meltzer's (1960) hypothesis that customers' liquidity and solidity problems are ameliorated through tolerated—albeit potentially costly—overdue payments. However, quantitatively, this effect constitutes a relatively small fraction of the movement in payables.

Let us briefly highlight some additional similarities to, and contrasts with, previous empirical work. Hitherto, most empirical studies of trade credit have followed in the footsteps of Petersen and Rajan (1997). They rely on balance-sheet data, and find that financially stronger firms have more receivables and less payables.[7] It is tempting to conclude from these studies that financially stronger firms are more liberal in their lending decisions, and that they are less reliant on suppliers for their funding. However, as Petersen and Rajan themselves observe, balance sheet data from a sample of firms do not admit reliable causal inference.

Recent work attempts to forge a link between receivables and payables by exploiting in-

[7] For other studies along similar lines, see Nilsen (2002), Fisman and Love (2003), Love, Preve, and Sarria-Allende (2007), Giannetti, Burkart, and Ellingsen (2011), and Carbó-Valverde, Rodríguez-Fernández, and Udell (2012).

formation on matched supplier-customer pairs. Specifically, Garcia-Appendini and Montoriol-Garriga (2013) and Shenoy and Williams (2011) find that suppliers have more receivables relative to sales when their own financial positions are strong and when the financial positions of their largest customers are weak. A natural inference is that credit duration increases in these circumstances. However, without transactions data, central questions remain open. What is the nature of the more extensive credit? Does contracted duration increase, do customers fail to take advantage of early payment discounts, or do constrained customers simply pay after the due date? And what is the impact of financial conditions on the transactions volume? These are examples of questions that we address.

To the best of our knowledge, the seminal work of Klapper et al. (2013) is the only previous study of trade credit contracts at the level of matched customer-supplier pairs. Their investigation is organized around a single snapshot of purchases of 56 large firms from about 24,000 suppliers, comprising about 29,000 contracts altogether. Their main finding is that strong customers may exert market power in order to gain favorable trade credit terms with weaker business partners. While this is the first analysis of individual trade credit transactions, their data set only has rudimentary information about the suppliers and customers. Therefore, it does not allow for a detailed examination of financial motives for trade credit. Besides being both substantially larger and longitudinal, our data set includes extensive financial information about all participants. We can therefore, in a coherent framework, identify financial motives and compare their importance with the market power motive. We confirm and strengthen the conclusion of Klapper et al. (2013) that customer market power helps to explain the variance in contract duration; our sales-share measure, intended to capture a customer's importance to its supplier, is of greater economic significance than customer size in this respect. We also confirm their suspicion that financial conditions are relatively unimportant for contract duration. However, this does not imply that financial conditions are unimportant for trade credit. Financially weaker customers buy more inputs, and they are also considerably more likely to pay late.

The paper is organized as follows. Section 2 describes the institutional setting, the data, and our empirical approach. Section 3 describes the empirical results and Section 4 concludes.

2 Data, Background, and Empirical Approach

Our core data set has been provided by the Swedish credit bureau Upplysningscentralen AB (UC). The data set contains detailed information on all completed trade credit contracts issued by 51 Swedish non-financial firms in the period 2004–2012. These specialized data exist because the credit bureau in 2003 launched a new service offering to supply their clients with continuous credit risk monitoring of their customers. The clients (i.e., suppliers) that decided to subscribe to this service were obliged to report details of every invoice (contract) issued for the payment of delivered inputs to customers. Importantly, the contract data provides details regarding the pecuniary size of the transaction, the maturity, and, subsequently, when actual payment occurred.[8]

The credit bureau has also provided us with data on accounting statements and balance sheet information for all Swedish corporate firms during the period 1989–2013.[9] Hence, we possess rich accounting information not only for all the suppliers, but also for all their domestic business customers. In Sweden, as in many other countries, firms have considerable discretion in choosing a fiscal year period for their financial statements. For a large fraction of the firm-year observations in our sample the fiscal year starts in the middle of a calendar year. We deal with this by interpolating the financial statements so as to align their fiscal year periods with calendar years.[10]

We construct an industry classification based on one-digit SNI codes (the Swedish equivalents to U.S. SIC codes) obtained from the accounting statements.

[8] The raw data contain contract information for 63 suppliers. After omitting financial firms and sole proprietorships, we end up with a sample of 52 suppliers. In order to let us access the data, the credit bureau required us to get written consent from each of the suppliers to use their data for research purposes. All of them but one agreed to this, hence the final sample has 51 suppliers.

[9] These data have been used in earlier contributions, see Jacobson, Roszbach, and Lindé (2013) for a comprehensive overview and Jacobson and von Schedvin (2015) for an application to trade credit chains. The accounting information is collected by the credit bureau from the Swedish Companies Registration Office (SCRO). Swedish law requires each corporate firm to submit an annual financial statement to the SCRO, covering balance sheet and income statement data in accordance with European Union standards. Moreover, every corporation is also required by Swedish law to hold in equity a minimum of SEK 100,000, roughly corresponding to USD 12,000.

[10] See Giordani, Jacobson, von Schedvin, and Villani (2011) for a detailed description of the interpolation procedure. The shares of shorter (less than 12 months) and longer (more than 12 months) statements are both around 5 percent. Whereas shorter statements than the stipulated 6 months occur, statements covering a longer period than the allowed 18 months are very rare. Over time, the annual shares of shorter/longer statement periods have come down from about 8 percent to currently around 4 percent. Thus, an overwhelming majority of statements concern a period of 12 months. However, out of the 90 percent of the total number of statements, only 48 percentage points coincide with a calendar year, and hence 42 percentage points refer to other 12 month periods. In these calculations we have allowed for a given calendar year to begin in mid-December the previous year, and end in mid-January the following year.

The number of firms subscribing to the monitoring service varies considerably over the sample period. Only 7 suppliers are observed for all years in the sample period, 8 are observed for 7 years, and the remaining 36 are observed for shorter periods. Table 1 reports the number of suppliers in each year of the sample period. The number of suppliers peaks at 42 in 2006 and drops to 18 at the end of the sample period. The suppliers are active in the following industries: Manufacturing, Construction, Retail, Communication and Transport, and Consulting and Rental.

[Insert Table 1 about here.]

Table 1 also records the number of customers that the suppliers provide trade credit to. Over the full sample period, the suppliers issued credit to about 199,000 unique customers. The three largest customer industries are Retail (23 percent), Consulting and Rental (23 percent), and Construction (15 percent). The number of customers also peaked in 2006, at about 116,000 and has since dropped to around 98,000 towards the end of the sample period. In 2009, a large number of suppliers, where some had a very large customer base, decided to stop participating in the monitoring service which resulted in a sharp drop in the number of customers that year.

Since the focus of the paper is on the role of trade credit issued for commercial purposes, we restrict our customer sample to active firms with real sales exceeding SEK 100,000 (deflating by the 2010 consumer price index).[11] Furthermore, a small fraction of the financial ratios in our sample is made up of severe outliers. In order to make sure that our results are not distorted by outliers, we adopt the common practice of winsorizing the financial ratios at the 1^{st} and the 99^{th} percentile. Finally, since every corporate firm in Sweden is associated with a unique identifier—known as an organization number—we can readily merge the accounting data and the contract data unambiguously.

2.1 Initial observations

The average amount of accounts payable to assets among the nearly 200,000 business customers that we observe is 12.6 percent (Table 3). Interviews with the suppliers confirm that virtually

[11] This real sales restriction, corresponding to USD 12,000, implies that we exclude customers in the lowest decile of the sales distribution, which alleviates a concern that small customers—with potentially irregular input purchasing patterns—if included, would have disproportionate effects on the analyses.

all their sales to business customers involve trade credit.[12]

The most common duration for trade credit contracts in Sweden is 30 net days (Swedish Government Official Reports 2007:55), this is also reflected in our sample, where the median is 30 days and the mean is 29.96 (Table 2).[13] Panel A of Figure 1 displays the distribution of net days in our data set: 41 percent of the contracts have exactly 30 net days and 72 percent have net days in the interval 26 to 35. Only 18 percent of the contracts have net days below 26 and 10 percent have net days above 35.[14]

[Insert Figure 1 about here.]

The Interest Rate Act of 1975 regulates creditors' rights in cases of overdue payments. Parties are free to agree on any maturity and any penalty interest rate. In the absence of a contract, creditors can charge a maximum penalty interest rate amounting to the so called Reference rate (set by the Swedish central bank) plus 8.00 percentage points. The penalty rate can be invoked no earlier than 30 days after the notice of payment has been given. According to the preparations of the 1975 act (Swedish Government Official Reports 1974:28), the 30 days were chosen to reflect standard trade practice. The new penalty rate of 8 percent plus the Riksbank reference rate replaced a fixed rate of 6 percent, which had been in place since 1734. A similar legal framework currently prevails within the European Union.[15]

Early payment discounts are in general not applied in Sweden. According to the supplier interviews, an important reason is that early payment discounts complicate the administration of value added tax (VAT) payments. Panel B in Figure 1 shows the payment behavior for the contracts in our data set. In accordance with the absence of early payment discount offers, the distribution shows that most contracts are paid around, or after, the due date. There is no noticeable spike at any earlier date.[16]

[12] The rare exceptions concern transactions with first-time customers and customers that have defaulted on previous commitments.

[13] Swedish Government Official Reports 2007:55.

[14] The contract duration in our sample is quite similar to that reported by Ng, Smith, and Smith (1999) for a sample of large U.S. suppliers. By contrast, Klapper, Laeven, and Rajan (2011) report much higher average (median) net days of 59 (60). However, their sample comprises very large customers.

[15] The Late Payments Directive, 2011/7/EU, aims to achieve a culture of prompt payment across Europe. European Union directives are instruments which require all member states to enact their provisions in national legislation, and for the Late Payments Directive the dead-line was set to March 16, 2013. A default maximal maturity of 30 days applies and cannot be exceeded unless otherwise expressly agreed *and* provided it is not grossly unfair to the supplier. The penalty interest rate is 8 percent plus a reference rate, in this case set by the Bank of England.

[16] While discounts are somewhat more frequent in the U.S., nowadays they are fairly rare also there; see Ng,

2.2 Representativeness

How representative are our suppliers? Due to data restrictions, it is impossible to evaluate differences between the sample suppliers and suitably matched control suppliers with respect to characteristics of trade credit contracts, or even crude measures of the size and nature of control suppliers' pool of customers. However, we can evaluate differences in balance sheet observables on the amounts of issued trade credit—accounts receivable—between the sample suppliers and sets of otherwise similar control firms. To this end, we make use of Abadie and Imbens's (2006) nearest-neighbor matching method to evaluate whether the suppliers in our sample exhibit accounts receivable that deviate from other suppliers with similar characteristics. Each of the 265 supplier-years are matched with one control firm—the closest match—drawn from the full population of Swedish corporate firms, where the matching is based on a set of firm characteristics, industry belonging, and location.[17] The average treated effect for the treated firms obtained from this exercise is 0.3 percent with a *p*-value of 0.832, indicating that the suppliers in our sample issue similar amounts of trade credit as do the suppliers in the control set.

2.3 Dependent variables

A trade credit transaction can be decomposed into three parts: The magnitude of the transaction, the contracted duration, and the deviation from the contracted duration. Versions of these measures, suitably aggregated and averaged, constitute our first three dependent variables.

Trade value. Our first dependent variable is the total amount of credit that supplier i issues to customer j in year t:

$$y^1_{i,j,t} = \frac{Contracts'\ size_{i,j,t}}{Assets_{j,t}} = \sum_{c=1}^{N_{i,j,t}} \frac{Contract\ size_{i,j,c,t}}{Assets_{j,t}}, \tag{1}$$

where $N_{i,j,t}$ is the number of trade credit contracts issued by supplier i to customer j in year t; $Contract\ size_{i,j,c,t}$ is the amount of trade credit for contract c provided by supplier i to customer

Smith, and Smith (1999); Giannetti, Burkart, and Ellingsen (2011); and Klapper, Laeven, and Rajan (2013).

[17] The matching variables are the log of number of employees, tangible assets-to-assets, cash holdings-to-assets, earnings-to-assets, the log of firm age, and two indicator variables for whether the firm pays out dividends, and whether it has a good credit rating. We also match with respect to two-digit industry codes, geographic location, and time. The outcome variable and matching variables pertain to time t.

j in year t; and $Assets_{j,t}$ is total assets of customer j in year t. Since we know that virtually all purchases are on credit, we refer to $y^1_{i,j,t}$ as the *trade value.*

Contracted duration. Our second dependent variable is the natural logarithm of the weighted average number of net days across all contracts c issued by supplier i to customer j in year t:

$$y^2_{i,j,t} = Log\left(Net\ days_{i,j,t}\right) = Log\left(\sum_{c=1}^{N_{i,j,t}} w_{i,j,c,t} \times Net\ days_{i,j,c,t}\right), \tag{2}$$

where

$$w_{i,j,c,t} = Contract\ size_{i,j,c,t} / \sum\nolimits_{c=1}^{N_{i,j,t}} Contract\ size_{i,j,c,t}.$$

This dependent variable relates to the key dependent variable reported in Klapper et al. (2013).

Overdue payment. Our third dependent variable is the weighted average number of days overdue across all contracts c issued by supplier i to customer j in year t:

$$y^3_{i,j,t} = Days\ overdue_{i,j,t} = \sum_{c=1}^{N_{i,j,t}} w_{i,j,c,t} \times Days\ overdue_{i,j,c,t}, \tag{3}$$

where days overdue, on the contract level, is defined as: $Days\,to\,payment_{i,j,c,t} - Net\ days_{i,j,c,t}$. This dependent variable provides a measure capturing customers' discretion to pay on time, or to postpone payments. The $Days\ overdue$-variable captures the average number of days overdue across contracts over a year. However, it could well be that customers face increased liquidity needs during shorter periods of time—for a few weeks or months—which $Days\ overdue$ would not fully capture.

Maximally late payment. In order to account for temporary postponements of payments within a year, we construct a fourth dependent variable, $y^4_{i,j,t} = Late\ payment$, which is based on the maximum number of days overdue across all contracts c issued by supplier i to customer j in year t:

$$Days\ overdue^{\max}_{i,j,t} = \max\left(Days\ overdue_{i,j,1,t}, ..., Days\ overdue_{i,j,N_{i,j,t},t}\right). \tag{4}$$

We set $Late\ payment$ equal to one if $Days\ overdue^{\max}_{i,j,t}$ is in the top decile of the $Days\ overdue^{\max}$-distribution, and zero otherwise. The top decile of the $Days\,overdue^{\max}$-distribution involves payments settled after 28 or more days overdue.

On the basis of the first three elementary variables, we compose two aggregate measures.

Contracted credit. The first aggregate measure captures the average volume of agreed credit:

$$y^5_{i,j,t} = \frac{Contracted\ credit_{i,j,t}}{Assets_{j,t}} = \sum_{c=1}^{N_{i,j,t}} \frac{Net\ days_{i,j,c,t}}{365} \times \frac{Contract\ size_{i,j,c,t}}{Assets_{j,t}}, \tag{5}$$

where $N_{i,j,t}$ is the number of trade credit contracts issued by supplier i to customer j in year t; $Net\ days_{i,j,c,t}$ is the maximum number of days until payment from customer j to supplier i agreed upon in contract c; $Contract\ size_{i,j,c,t}$ is the amount of trade credit for contract c provided by supplier i to customer j in year t; and $Assets_{j,t}$ is total assets of customer j in year t. If invoices were paid exactly on the due date, this measure would capture the average amount owed by customer j to supplier i on any given day in year t.

Realized credit. The second aggregate measure captures the average volume of actually utilized credit:

$$y^6_{i,j,t} = \frac{Realized\ credit_{i,j,t}}{Assets_{j,t}} = \sum_{c=1}^{N_{i,j,t}} \frac{Days\ to\ payment_{i,j,c,t}}{365} \times \frac{Contract\ size_{i,j,c,t}}{Assets_{j,t}}, \tag{6}$$

where $N_{i,j,t}$ is the number of trade credit contracts issued by supplier i to customer j in year t; $Days\ to\ payment_{i,j,c,t}$ is the number of days until supplier i obtained payment from customer j for contract c; $Contract\ size_{i,j,c,t}$ is the amount of trade credit for contract c provided by supplier i to customer j in year t; and $Assets_{j,t}$ is total assets of customer j in year t. Thus, our sixth dependent variable gives a precise measure of trade credit issuance and actual usage by supplier i and customer j on any given day in year t.

2.4 Independent variables

As usual in the trade credit literature, the firm characteristics that we consider are measures of size (the number of employees), dividend policy, and asset composition (tangible assets, cash holdings), as well as credit rating and profitability (EBITDA). Apart from size, these variables can be seen as different indicators of how financially constrained the firm is at any moment in time. Dividend payouts are made when all highly profitable investments have already been funded; technologies relying on tangible assets are easier to fund due to the collateral that tangible assets offer; and high profitability reduces the firm's incentive to default.

In addition, we include in our regressions three relationship characteristics: Whether the

supplier and customer is located in the same county, the observed duration of the relationship, and the customer's share of the supplier's sales.[18] Table 2 lists and defines all variables.

[Insert Table 2 about here.]

To reduce concerns of endogeneity, the explanatory variables are typically lagged in our regressions. Needless to say, most of these variables are still to some extent endogenous—in the sense that there are more primitive factors that affect them (factors that may also affect the dependent variables through other channels). Thus, the empirical analysis will provide suggestive evidence rather than clean causal inference.

2.5 Descriptive statistics

The first panel in Table 3 provides descriptive statistics at the contract level (first panel), and at the supplier-customer level (second and third panels). The first panel shows that average contract size is SEK 6,801 (approximately USD 800). The maturities range from 17 days at the 10^{th} percentile to 40 days at the 90^{th} percentile, with an average and median outcome of 30 days. On average customers exceed due payment by a few days, which yields average credit duration and days overdue just shy of 32 and 2. Since we only observe completed contracts, this measure of days overdue does not take account of defaults.[19]

The second panel shows descriptive statistics for the contracts, aggregated to a year-level for given supplier-customer pairs. The average yearly amount of contracted trade credit within supplier-customer pairs is SEK 183,000 on average, which corresponds to 3.3 percent of the customer's assets. The volume-weighted average number of net days is 24.8, with a standard deviation of 7.7. (The reduction in days due to volume weighting means that larger contracts have significantly shorter duration.) The variables measuring days overdue at the supplier-customer level show that average late-payments increase by half a day to 2.4, as compared with measurement at the contract level, indicating that late payments are more frequent for larger contracts within the supplier-customer pairs. However, average late payment hides much

[18] Relationship length is measured as the number of years the supplier-customer relationship is observed in the data. We measure sales share as the amount of received trade credit from a supplier scaled by the total amount of issued trade credit by the supplier

[19] With yearly bankruptcy rates of about 2-3 percent and credit duration of one month, the probability that any invoice is not paid due to bankruptcy will be on the order of 0.2 percent.

heterogeneity. The variable $Days\ overdue_{i,j,t}^{max}$ considers the maximal delay in payment in each customer-year and its average at 10.7 is roughly four times greater than that of the yearly average days overdue.

Finally, the third panel reports statistics on relationship characteristics. As many as 29 percent of the supplier-customer pairs are located within the same county (Sweden has 24 counties, or regions), and their average relationship length is around 3 years. The sales directed to specific customers on average only make up a tiny share of a suppliers' total sales.

[Insert Table 3 about here.]

Table 4 reports descriptive statistics on supplier and customer characteristics. The table also includes statistics describing the entire Swedish corporate sector in the same time period. On average, our suppliers are substantially larger than the average Swedish firm, as given by assets, sales, and number of employees. The customers are on average substantially smaller than the suppliers, but still larger than the average Swedish firm.

[Insert Table 4 about here.]

Figure 2 displays the distribution of the number of our suppliers that a customer interacts with in any given year. About 63 percent of the customer-years concern customers that have relationships with one supplier only, which means that 37 percent of the customer-years involve customers that purchase from at least two of our suppliers.

[Insert Figure 2 about here.]

2.6 Empirical approach

We consider a set of models in which the dependent variable $y_{i,j,t}^{k}$ corresponds to the variables defined in equations (1)-(6). Model specifications take the form:

$$(7) \qquad y_{i,j,t}^{k} = \boldsymbol{\alpha}_{i,j,t} + \boldsymbol{\beta}_S \times \mathbf{S}_{i,t-1} + \boldsymbol{\beta}_D \times \mathbf{C}_{j,t-1} + \boldsymbol{\beta}_R \times \mathbf{R}_{i,j,t-1} + \varepsilon_{i,j,t},\ k = 1, 2, \ldots, 6,$$

where $\boldsymbol{\alpha}_{i,j,t}$ is a vector of fixed effects; $\mathbf{S}_{i,t-1}$ is a vector of supply factors pertaining to supplier i in year $t-1$; $\mathbf{C}_{j,t-1}$ is a vector of demand factors pertaining to customer j in year $t-1$; $\mathbf{R}_{i,j,t-1}$

is a vector of relationship specific characteristics pertaining to the supplier i and customer j pair in year $t-1$; and $\varepsilon_{i,j,t}$ is the error term. The vectors $\mathbf{S}_{i,t-1}$ and $\mathbf{C}_{j,t-1}$ include variables that reflect firms' availability and cost of external financing and the vector $\mathbf{R}_{i,j,t-1}$ includes relationship variables.

The fixed effects, $\boldsymbol{\alpha}_{i,j,t}$, are key to the causal interpretation of other coefficients, and we consider a variety of fixed-effect combinations for each dependent variable. In our *baseline* specification we include fixed effects at the level of supplier-customer matches. By including match-fixed effects we study the variation over time within a given pair of supplier and customer. This specification deals with biases introduced by endogenous matching outcomes. Such a bias may occur if supplier and customer characteristics influence the likelihood for observed supplier-customer matches.

While we focus most of our attention on this baseline specification, we additionally investigate a variety of other formulations that allow a bigger role for factors that differ across relationships. We also study variation at the contract level. We postpone the discussion of these alternative specifications.

Although our annualized data set is very large, including more than 1.4 million observations, contract data give rise to pair-wise observations of the outcomes of interest. With few suppliers serving many customers, an important concern is that correlations within the supplier clusters may entail downward-biased standard errors. We handle this problem by clustering standard errors at the supplier-level throughout, cf. Cameron and Miller (2015).

3 Results

This section presents the main empirical analyses and results; quantifying how supplier and customer characteristics associate with the credit volume measure, maturities, and factual credit durations. In a first step, we quantify relationships within supplier-customer pairs over time applying a strict match-fixed effect specification. In a second step, we expand the conditioning set and also evaluate the associations between firm-relationship characteristics and the set of dependent variables in a specification with separate fixed effects for suppliers and customers. In a third step, we consider relationships between firm-characteristics and customers' accounts

payable measured at the aggregate level. That is, we estimate aggregate models using similar explanatory variables, but now discarding our input transactions data. This step establishes a tight link with the bulk of the empirical trade credit literature to date. In a final step we evaluate robustness across alternative specifications.

3.1 Determinants of contract features

3.1.1 Baseline results

Table 5 reports coefficients and measures of economic significance for regression models according to Eq. (7), using the baseline match-fixed effects model specification. The measure of economic significance is the difference between the 10^{th} and 90^{th} percentiles in a given explanatory variable's distribution.[20] We want to interpret the economic significance measure in terms of a percentage shift in a dependent variable. Thus, the differences in explanatory variables are multiplied by the coefficients in question, and the resulting products are normalized by: the means of the dependent variables for regressions concerning $y^1_{i,j,t}$ and $y^4_{i,j,t}$; the mean number of net days for $y^3_{i,j,t}$; and no normalization for $y^2_{i,j,t}$ (since the coefficients already express percentage changes for this dependent variable).

[Insert Table 5 about here.]

Supplier effects. The upper part of Table 5 reveals, as one might expect in view of the low number of suppliers, that we have little statistical power to detect significant associations between contract features and supplier characteristics. Only size, measured by the number of employees, comes out as statistically significant. The regularity, established in Column (I), that transaction volume correlates positively with supplier size is probably mostly mechanical. The positive relationship between supplier size and agreed contract duration in Column (III) is more noteworthy. When a supplier grows larger, it offers longer net days (or vice versa; we discuss causality more below). With an average maturity of 24.8 days, the economic significance measure of 1.4 percent implies that the resulting difference in duration according to our 90/10

[20] The percentiles underlying the measures of economic significance are taken from demeaned distributions. Thus, we remove year-, supplier-, customer-, and supplier$\times$customer-means, according to model specification, in the explanatory variables.

percentile gap is about 0.35 days. Thus, large suppliers contribute somewhat more to the economy's credit than small firms do, but the magnitude of the effect is modest. The relationship between supplier size and days overdue, Column (V), is also of small economic significance. Less than half a percent of an average of 24.8 days is virtually nothing (note that the economic significance for $Days\ overdue$ is calculated based on the average number of $Net\ days$).

Column (VII) identifies the determinants of more extreme overdue events; lasting 28, or more days. While the coefficient signs are similar to those in Column (V), we see from Column (VIII) that economic magnitudes are greater. That is, late payment events which are likely to invoke more strain on the relationships between trading partners, are more strongly related to suppliers' financial conditions. A supplier is more likely to be exposed to—or tolerate—such extreme events if it is larger, and if it is paying out dividends to owners.

Customer effects. The middle part of Table 5 reports the coefficients on customer characteristics. Thanks to the very large number of customers, these coefficients are quite precisely estimated. Our first observation is that improvements in customer characteristics are generally associated with smaller transaction volumes, cf. Column (I). According to the economic significance measures we see that a shift from dividend non-paying to paying status renders a reduction in customers' trade credit value by 4.3 percent; an increase in the share of tangible assets-to-asset share yields a reduction by 3.2 percent. These findings are surprising, as they appear to contradict the widespread notion that firms' input purchases are held back by financial constraints. For example, in the theoretical model of trade credit by Burkart and Ellingsen (2004), the value of input purchases always increases as customer characteristics improve. The reduction in customers' trade credit is a central finding, and we pursue its implications in more detail below.

In Column (III), customer size displays a statistically significant correlation with agreed contract maturity. Larger customers obtain more net days. This result is in accordance with Klapper et al. (2013) and points to market power as a determinant of trade credit duration. Large customers can exploit their bargaining positions against smaller and weaker suppliers and extract contracts with longer maturities. In order to probe this hypothesis further we introduce a $Sales\ share$-measure, to capture manifestation of market power outside the firm size dimension. As anticipated, customers whose contracts constitute a large share of a supplier's

total sales tend to obtain more net days. But in both cases, the economic significance of the effect is tiny: 0.2 percent for a customer size shift and 0.1 percent for a shift in $Sales\ Share$. Thus, at least within a relationship, the agreed contract duration is overall insensitive to changes in customer characteristics.

Column (V) reveals that improvements in customer characteristics tend to reduce overdue payment. Qualitatively, this finding is supportive of the hypothesis that financially challenged customers will violate the due date even if there are financial and reputation costs associated with doing so—a mechanism that was initially emphasized by Meltzer (1960); see also Cuñat (2007). However, the economic significance of the effects are again very small. Moreover, customers' propensity to indulge in late payments also reflects exertion of market power, but the effects are again of very small economic significance: 0.3 percent for a shift in customer size and 0.1 percent for a $Sales\ Share$ shift.

Column (VII), second panel, reports effects from customer characteristics on the $Late\ payment$-variable, capturing the extreme overdue events. Coefficient signs are similar to the corresponding ones for $Days\ overdue$ in Column (V), while economic magnitudes are greater, as noted also for supplier characteristics. That is, $Late\ payment$-events are more strongly related to customers' financial positions than are $Days\ overdue$-events, which suggests that financially weak firms draw more credit from their suppliers through temporary postponements of payments during the year. Moreover, the interpretation of market power presence through the effects from customer size and $Sales\ Share$ holds and is enlarged in the $Late\ payment$-regression.

3.1.2 Relationship effects

Table 6 provides results for a set of regressions, where the strict within-pair and over time perspective imposed by the match-fixed effect specification is replaced with a more parsimonious specification of Eq. 7, that also accounts for variation across relationships. The specification is still strict in that we include time-, supplier-, and customer-fixed effects. In this setting we can investigate how relationship characteristics, such as geographic proximity and the duration of the relationship affect trade credit volumes and other contract terms.

[Insert Table 6 about here.]

The lower part of Table 6 reports our results on relationship characteristics. Being located in the same county has little impact on the volume of trade, the net days, and days overdue. However, the customer is more likely to have an extremely late payment to a nearby supplier. Longer relationships are associated with more trade credit, as shown in Column (I), whereas net days are slightly fewer in longer relationships, Column (III). Whereas relationship length has no significant effect on $Days\ overdue$, as shown in Column (V), the effect on the $Late\ payment$-variable is substantial. The economic significance measure in Column (VIII) suggests that a longer relationships is associated with a 10.6 percent larger probability of being involved in an extremely late payment. Finally, customers with a large sales shares receive somewhat more net days, and are considerably more likely to pay very late. The $Sales\ share$ evidence is closely in line with the market power hypothesis of Wilner (2000). Suppliers prioritize important customers for trade credit, especially when it comes to extreme overdue periods.

Note that the results with respect to supplier and customer characteristics in the upper and middle parts of Table 6 are very close to the corresponding estimates in Table 5. Thus, even if customers' choices of suppliers may change in response to financial condition, such selection effects are not strong enough to counteract within-relationship associations.

3.2 Determinants of compounded measures

Table 7 reports results for our compounded dependent variables, $Contracted\ credit$, $y^5_{i,j,t}$ (the total amount of credit that supplier i issued to customer j in year t adjusted for the number of net days in the contract); and $Realized\ credit$, $y^6_{i,j,t}$ (the total amount of credit adjusted for the number of days until supplier i obtained payment from customer j). Columns (I) and (IV) present results from the baseline match-fixed effects specification, and Columns (V) and (VIII) cover the parsimonious specification with time-, supplier-, and customer-fixed effects.

[Insert Table 7 about here.]

The central observation is that the estimated effects of the supplier, customer, and relationship characteristics mainly mirror the coefficients in the $Contracts'\ size$ regressions in Tables 5 and 6, rather than the coefficients in the regressions for $Net\ days$ and $Days\ overdue$ in these tables. In other words, it is the transaction volume rather than the contract terms that dominates

variation in the trade credit that a customer has with its supplier. This finding confirms what one might already expect from the economic significance measures in Table 5 in being typically larger for the $Contracts'\ size$ model. Thus, variation in contract size is important, variation in maturity or late payments is not.

To what extent do the results on $Realized\ credit$ in Table 7—where we model trade credit outcomes for given supplier—correspond to a regression in which we seek to explain customers' aggregate trade credit usage by means of their total payables to all of their suppliers; the kind of empirical framework typically reported in the literature? Table 8 answers this question.

[Insert Table 8 about here.]

Columns (I) and (II) in Table 8 report the results for a regression of aggregate accounts payable (normalized by assets) on customer characteristics only. We find that the coefficients' signs and the economic significance measures are remarkably similar across the two aggregation levels of the dependent variable. To further buttress the interpretation that variation in aggregate payables is driven primarily by transaction volumes, we estimate the same specification in a regression model with input costs (as given by the customers' balance sheets) as the dependent variable, finding closely similar results in Columns (III) and (IV).

Finally, to investigate what part of variation in accounts payable that cannot be accounted for by transaction volume, we regress the ratio of accounts payable to input costs on the same set of regressors, cf. Column (V). In this model the explanatory variables should only capture variation in the dependent variable due to variation in credit duration. Accordingly, we find that the economic significance measures in Column (VI) assume magnitudes on par with the levels previously found for the contract duration variables—$Net\ days$ and $Days\ overdue$. Thus, the variation in aggregate payables is very similar to the variation in the compounded trade credit measures in our contract data.

To summarize: We know from Tables 5–7 that variation in the compounded contract data measures is driven by variation in transaction volumes in our data set. Table 8 strongly suggests that the same is true when aggregating across the customers' entire sets of suppliers; that is, including suppliers that we do not observe in the contract data. Hence, we draw the paper's main conclusion: the relationship between a firm's accounts payable and its financial condition

is primarily caused by variation in the value of input purchases, and not by variation in trade credit maturity, nor by factual duration.

3.3 In-depth specifications

Generality and robustness. We will now consider a set of alternative specifications of Eq. (7) to examine the generality and robustness of our findings above. To simplify the analyses, we limit this part to the dependent variable $Realized\,credit$, which is the net outcome of all three key dimensions of trade credit: contract size, net days, and days overdue. The first model-specification is a looser version of Eq. (7), where we substitute the supplier- and customer-fixed effects with supplier industry- and customer industry-fixed effects at the one-digit industry level. The reason for considering this parsimonious model specification is to explore the extent regularities documented within the supplier-customer pairs are demonstrated in the cross-section. Columns (I) and (II) in Table 9 show that enhanced customer characteristics are associated with reduced trade credit provisioning in the supplier-customer pair. The economic effects suggest that the considered factors are associated with substantial cross-sectional customer variation in utilized trade credit. Similarly to our baseline results, unreported regressions show that the effects from improved customer financial characteristics mainly lead to reductions in input purchases.

[Insert Table 9 about here.]

Our second model-specification goes in the other direction: a stricter version of Eq. (7), where we include match- and supplier$\times$year-fixed effects. The interacting-fixed effects between supplier and year will fully account for time-varying, and invariant, supplier characteristics. Results for the model are reported in Columns (III) and (IV). The coefficients for the customer characteristics are very similar to the ones reported for our baseline specification, cf. Column III, Table 7, which suggests that our main results are not confounded by any unobserved variation in supplier characteristics.

Columns (V) and (VI) report results for a third model-specification, which now includes sales, instead of number of employees, to measure the size of the suppliers and customers, but otherwise includes the match-fixed effects according to baseline. The effects are very similar to the ones reported for our baseline model, which suggests that our findings are robust to

alternative measures of firm size. Unreported regressions show similar results when including assets as a measure of size.

In our fourth model-specification we include a modified version of the dependent variable: $Realized\ credit$ is now scaled by customer sales instead of customer assets, and, again, resumes the match-fixed effects. The reason to consider this alternative scaling is to relate input purchases to a measure of customers' output. Columns (V) and (VI) show that the effects are very similar to the ones reported for our baseline specification, except for the coefficient on cash-holdings which exhibits a sign inversion.

Contract-level regressions. As a final exercise, we estimate the match-fixed effects model and the model including separate supplier- and customer-fixed effects on dependent variables measured at the contract level. Table A1 and A2 report results for the three contract dimensions: $Contract\ size$, $Net\ days$, and $Days\ overdue$. The results at the contract-level closely coincide with our baseline results at the annual supplier-customer level, showing that the largest effects are observed for the amount of input purchases. One exception is, however, the impact of $Sales\ share$, which appears to play a less prominent role at the contract-level. The discrepancy between the results at the annual-level and contract-level for $Sales\ share$ suggests that customers with a larger sales share obtain longer net days primarily for large contracts. More specifically, when calculating $Net\ days$ and $Days\ overdue$ at the annual-level we control for the size of the contract, cf. Eq. (1) and (2). Thus, large contracts have a larger influence on our baseline results.

4 Conclusion

Our analysis demonstrates that variation in accounts payable is caused primarily by variation in the value of input transactions. Contract maturity and overdue payment vary too, but their fluctuations have only a minor impact on aggregate trade debt. Remarkably, improvements in the customers' financial conditions tend to reduce the value of input purchases, not increase it.

There are at least three potential explanations for the negative relationship between customers' financial strength and the value of input purchases. First, in the presence of significant default risks, such risks may be factored into purchasing prices. As the financial positions

of firms improve and the risks go down, so do prices. Second, improved financial conditions may enable firms to undertake long-run investments that reduce their input requirements, either through improved efficiency or by bringing more activities inside the boundaries of the firms. Third, exogenous productivity improvements could simultaneously reduce input requirements and improve financial conditions. Discriminating between these three explanations, which are not mutually exclusive, would require data that we currently lack.

Whatever the deeper explanations for our findings, it seems quite clear that the firms we study do prefer trade credit over others sources of working-capital funding. This insight contradicts the common view that trade credit is used as a secondary source of funds, to be exploited as bank credit becomes scarce. Thus, we need a new theory of trade credit. It should explain not only why trade credit exists, but why it is priced in such a way as to become firms' preferred arrangement of short-term credit.[21]

[21] Daripa and Nilsen (2012) offer one such theory, but in their model trade credit is only preferred when suppliers have higher price-cost margins than do customers. Hence, as it stands, we think that this model does not produce a sufficiently universal preference for trade credit.

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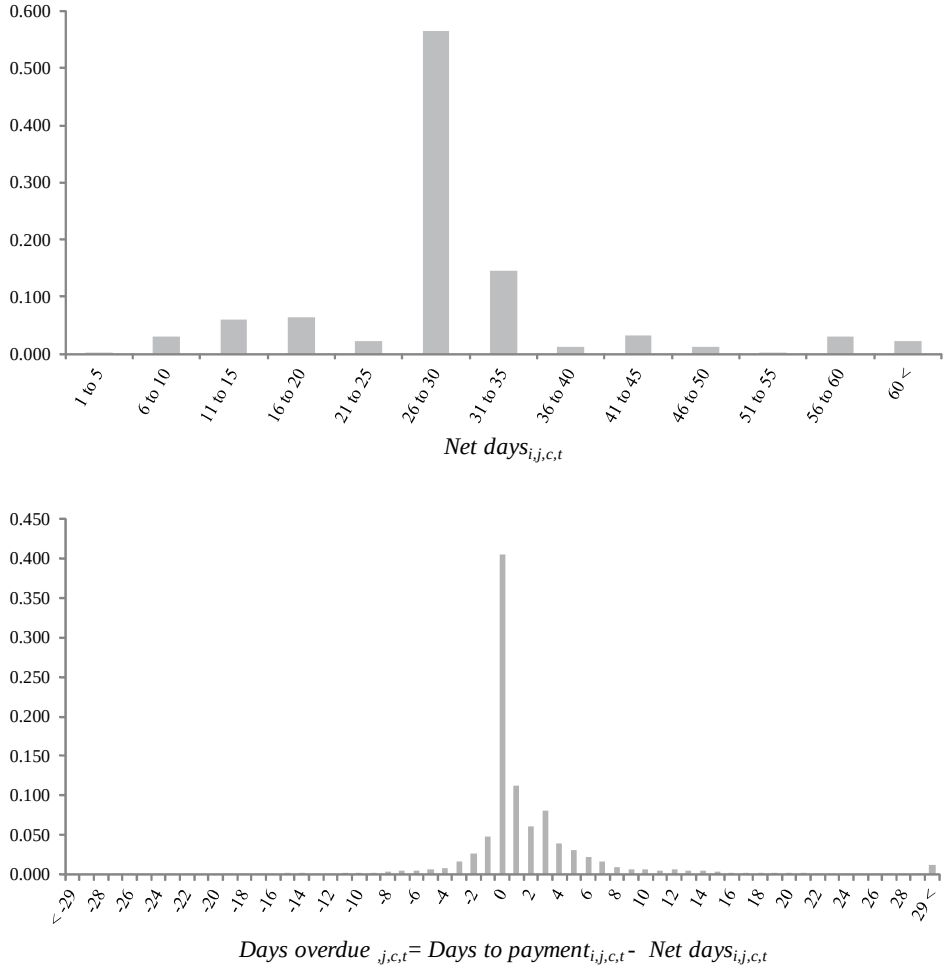
FIGURE 1

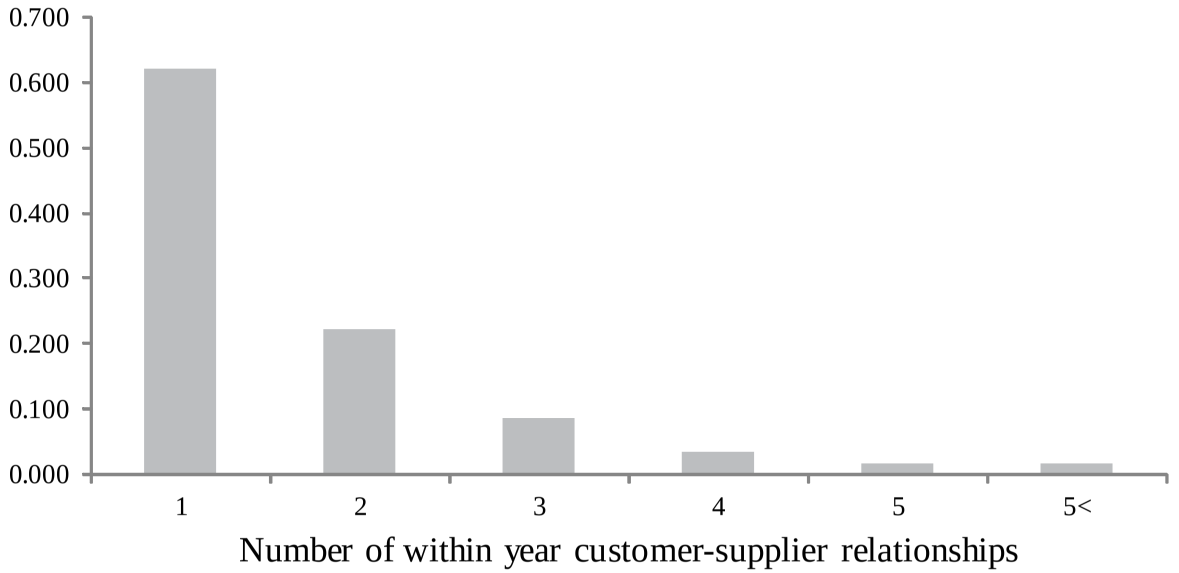
NET DAYS AND DAYS OVERDUE



This figure shows the distribution of *Net days* (*Net days* minus supplier median *Net days*) and *Days overdue*.

FIGURE 2

THE NUMBER OF WITHIN YEAR CUSTOMER-SUPPLIER RELATIONSHIPS



This figure shows the distribution of within year customer-supplier relationships. The distribution is constructed by counting the number of suppliers that each customer obtains credit from in a given year.

TABLE 1

SAMPLE COMPOSITION

Groups	2004-2012	2004	2005	2006	2007	2008	2009	2010	2011	2012
1. Suppliers										
Number of suppliers	**51**	**35**	**39**	**42**	**36**	**31**	**18**	**24**	**22**	**18**
1.1 Industry distribution										
Manufacturing	0.255	0.200	0.256	0.238	0.278	0.258	0.278	0.375	0.409	0.389
Construction	0.020	0.029	0.026	0.024	0.000	0.000	0.000	0.000	0.000	0.000
Retail	0.471	0.543	0.462	0.476	0.444	0.452	0.389	0.333	0.273	0.278
Communication & Transport	0.176	0.143	0.154	0.167	0.194	0.161	0.167	0.167	0.182	0.222
Consulting & Rental	0.078	0.086	0.103	0.095	0.083	0.129	0.167	0.125	0.136	0.111
2. Customers										
Number of customers	**199,405**	**80,178**	**105,439**	**116,697**	**110,627**	**103,262**	**47,262**	**93,652**	**100,272**	**97,882**
2.1 Industry distribution										
Agriculture	0.022	0.016	0.020	0.020	0.018	0.020	0.012	0.020	0.021	0.023
Manufacturing	0.126	0.187	0.168	0.157	0.155	0.154	0.132	0.137	0.135	0.133
Construction	0.148	0.168	0.151	0.147	0.146	0.161	0.163	0.188	0.194	0.198
Retail	0.229	0.256	0.254	0.254	0.249	0.242	0.224	0.215	0.207	0.202
Hotel & Restaurant	0.042	0.029	0.030	0.034	0.037	0.036	0.060	0.041	0.039	0.038
Communication & Transport	0.062	0.048	0.058	0.056	0.057	0.063	0.045	0.066	0.067	0.067
Bank, Finance & Insurance	0.019	0.016	0.017	0.018	0.018	0.017	0.018	0.016	0.015	0.014
Real Estate	0.067	0.059	0.058	0.060	0.058	0.055	0.051	0.061	0.062	0.063
Consulting & Rental	0.228	0.183	0.201	0.209	0.214	0.205	0.231	0.204	0.202	0.202
Not classified	0.058	0.037	0.043	0.045	0.048	0.047	0.062	0.053	0.057	0.060

This table shows the number of suppliers and customers over the sample period and their distributions across industries.

TABLE 2

VARIABLE LIST

Variables	Description
1. Contract characteristics	
1.1. Contract level	
Contract size$_{i,j,c,t}$	The size of contract c issued by supplier i to customer j in year t.
Net days$_{i,j,c,t}$	The net days on contract c issued by supplier i to customer j in year t.
Days to payment$_{i,j,c,t}$	The number of days until supplier i obtained payment from customer j for contract c.
Days overdue$_{i,j,c,t}$	The number of days overdue on contract c issued by supplier i to customer j in year t (=*Days to payment*$_{i,j,c,t}-$*Net days*$_{i,j,c,t}$).
1.2. Supplier-customer level	
Contract size$_{i,j,t}$	Calculated according to Eq. (1).
Net days$_{i,j,t}$	Calculated according to Eq. (2).
Days to payment$_{i,j,t}$	The weighted average days to payment on trade credit issued by supplier i to customer j in year t. *Contract size*$_{i,j,c,t}$ is used as weights.
Days overdue$_{i,j,t}$	Calculated according to Eq. (3).
Days overdue$^{\max}_{i,j,t}$	Calculated according to Eq. (4).
Contracted credit$_{i,j,t}$	Calculated according to Eq. (5).
Realized credit$_{i,j,t}$	Calculated according to Eq. (6).
$N_{i,j,t}$	Number of contracts issued by supplier *i* to customer *j* in year *t*
2. Firm characteristics	
Accounts receivable	Outstanding accounts receivable at the end of the accounting year.
Accounts payable	Outstanding account payable at the end of the accounting year.
N. Emp.	Number of employees.
Assets	Book value of assets.
Sales	Total sales.
Div (0/1)	Indicates whether the firm pays dividend, or not.
Tangible assets	Property, plants, and equipment.
High Rating (0/1)	Rating assigned by the credit bureau UC AB; corresponds to a yearly $PD < 0.75\%$.
Cash/Assets	Csh and liquid assets to total assets.
EBITDA	Earnings before interest, taxes, depreciation, and amortization.
Input costs	Is calculated as operating expenses minus labor costs.
3. Relationship characteristics	
Same County (0/1)	Takes the value one if the suppliers and customer are located in the same county (Swedish län), and zero otherwise.
Relationship length	The number of years that a relationship between supplier i and customer j has been observed in the data.
Sales share	The share of the suppliers total sales that is directed towards the customer.

This table provides definitions of the dependent and explanatory variables.

TABLE 3

CONTRACT CHARACTERISTICS

Variable	Mean	Median	10^{th} perc.	90^{th} perc.	Std. Dev
A. Contract level					
Contract size$_{i,j,c,t}$ (In SEK 1 000)	6.801	1.273	0.150	14.125	18.791
Net days$_{i,j,c,t}$	29.999	30.000	17.000	40.000	9.996
Days to payment$_{i,j,c,t}$	31.864	30.000	18.000	46.000	11.646
Days overdue$_{i,j,c,t}$	1.766	0.000	-1.000	7.000	6.202
B. Supplier-customer level: Dependent variables					
Contracts' size$_{i,j,t}$ (In SEK 1 000)	183.218	12.100	0.771	301.655	656.371
Contracts' size$_{i,j,t}$/*Assets*$_{j,t}$ (%)	3.306	0.263	0.007	5.884	11.148
Net days$_{i,j,t}$	24.830	29.553	11.816	30.995	7.700
Days to payment$_{i,j,t}$	27.667	29.582	13.467	36.373	13.432
Days overdue$_{i,j,t}$	2.400	1.000	-2.000	8.765	6.574
Days overdue$^{max}_{i,j,t}$	10.705	5.000	0.000	28.000	18.159
Contracted credit$_{i,j,t}$ (In SEK 1 000)	13.981	0.775	0.044	21.702	51.951
Contracted credit$_{i,j,t}$/*Assets*$_{j,t}$ ($\times$1,000)	2.402	0.170	0.004	3.953	8.455
Realized credit$_{i,j,t}$ (In SEK 1 000)	14.964	0.856	0.048	23.347	55.406
Realized credit$_{i,j,t}$/*Assets*$_{j,t}$ ($\times$1,000)	2.602	0.185	0.005	4.376	9.103
$N_{i,j,t}$	24.291	9.000	1.000	50.000	54.134
C. Supplier-customer level: Relationship characteristics					
Same County$_{i,j}$ *(0/1)*	0.288	0.000	0.000	1.000	0.453
Relationship length$_{i,j,t}$	2.949	2.000	1.000	6.000	2.132
Sales share$_{i,j,t}$ (%)	0.008	0.001	0.000	0.015	0.030
N. Contracts			52,958,622		
N. Supplier-Customer-Years			1,438,918		
N. Suppliers			51		
N. Customers			199,405		
N. Unique matches			487,436		

This table shows descriptive statistics for the contracts, Panel A, the variables underlying the six dependent variables, Panel B, and the relationship characteristics, Panel C. Variable definitions are provided in Table 2.

TABLE 4

SUPPLIER AND CUSTOMER CHARACTERISTICS

	1. Suppliers			2. Customers			3. Corporate sector			*p*-values	
Variables	Average	Median	Std. Dev	Average	Median	Std. Dev	Average	Median	Std. Dev	1. vs. 3.	2. vs. 3.
Accounts receivable/Assets	0.229	0.203	0.144	0.193	0.148	0.183	0.153	0.085	0.179	0.000	0.000
Accounts payable/Assets	0.159	0.137	0.110	0.126	0.083	0.133	0.103	0.048	0.137	0.000	0.000
Accounts payable/Input costs	0.103	0.094	0.054	0.100	0.080	0.092	0.098	0.064	0.134	0.653	0.000
Input costs/Assets	1.737	1.436	1.282	1.423	1.081	1.306	1.271	0.829	1.441	0.000	0.000
Assets (In SEK Mill.)	5,240.000	656.000	14,100.000	35.100	2.749	200.000	13.300	1.831	49.200	0.000	0.000
Sales (In SEK Mill.)	4,670.000	1,310.000	11,600.000	36.000	4.657	176.000	12.800	2.332	39.100	0.000	0.000
Number of employees	1,469	320	4,318	15.664	5.000	56.973	7.041	3.000	13.899	0.000	0.000
Div	0.302	0.000	0.460	0.377	0.000	0.485	0.344	0.000	0.475	0.150	0.000
Div/Assets	0.023	0.000	0.050	0.028	0.000	0.059	0.030	0.000	0.067	0.092	0.000
Tangible assets/Assets	0.214	0.133	0.198	0.217	0.095	0.259	0.223	0.081	0.283	0.588	0.000
High Rating (0/1)	0.536	1.000	0.500	0.355	0.000	0.479	0.355	0.000	0.479	0.000	0.610
Cash/Assets	0.067	0.027	0.093	0.236	0.156	0.241	0.266	0.173	0.270	0.000	0.000
EBITDA/Assets	0.126	0.121	0.094	0.117	0.114	0.184	0.110	0.106	0.237	0.264	0.000
Number of firms		51			199,405			383,713		–	
Number of firm-years		265			855,271			2,116,519		–	

This table shows descriptive statistics for the suppliers and customers with respect to their balance sheet characteristics and external ratings. Variable definitions are provided in Table 2.

TABLE 5

DETERMINANTS OF CONTRACT CHARACTERISTICS—MATCH-FE

	Dependent variables:							
	Contracts' size$_{i,j,t}$/ *Assets*$_{j,t}$		Log[*Net days*$_{i,j,t}$]		*Days overdue*$_{i,j,t}$		*Late payment*$_{i,j,t}$ (0/1)	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Variables	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.
1. Supplier characteristics								
Log[*N. Emp.*$_{i,t-1}$]	6.441***	0.229	0.012***	0.014	0.076*	0.004	0.010***	0.112
	(4.5)		(4.0)		(1.7)		(5.9)	
Div$_{i,t-1}$ (0/1)	4.986	—	0.000	—	−0.243	—	0.018**	0.171
	(1.1)		(0.0)		(−1.4)		(2.0)	
Tangible assets/Assets$_{i,t-1}$	−62.153	—	−0.189	—	−0.968	—	−0.052	—
	(−0.7)		(−1.0)		(−0.4)		(−0.5)	
High Rating$_{i,t-1}$ (0/1)	5.021	—	0.010	—	−0.070	—	0.004	—
	(1.0)		(1.5)		(−0.7)		(0.4)	
Cash/Assets$_{i,t-1}$	46.473	—	0.058	—	−0.242	—	0.007	—
	(1.4)		(0.6)		(−0.3)		(0.2)	
EBITDA/Assets$_{i,t-1}$	−26.963	—	−0.068	—	−1.848	—	−0.096	—
	(−0.6)		(−1.6)		(−1.3)		(−1.1)	
2. Customer characteristics								
Log[*N. Emp.*$_{j,t-1}$]	−0.140	—	0.005***	0.002	0.176***	0.003	0.009***	0.035
	(−0.2)		(3.3)		(5.2)		(2.9)	
Div$_{j,t-1}$ (0/1)	−1.416**	−0.043	−0.000	—	−0.188***	−0.008	−0.005***	−0.048
	(−2.4)		(−0.1)		(−11.7)		(−2.7)	
Tangible assets/Assets$_{j,t-1}$	−9.701*	−0.032	0.003*	0.000	0.121*	0.001	0.002	—
	(−1.8)		(1.9)		(1.8)		(0.8)	
High Rating$_{j,t-1}$ (0/1)	−0.600	—	−0.000	—	−0.041***	−0.002	−0.000	—
	(−0.9)		(−0.8)		(−2.7)		(−0.2)	
Cash/Assets$_{j,t-1}$	−8.380*	−0.045	−0.003	—	−1.097***	−0.008	−0.029***	−0.049
	(−1.8)		(−1.5)		(−10.8)		(−4.1)	
EBITDA/Assets$_{j,t-1}$	−5.511***	−0.033	−0.000	—	−1.325***	−0.011	−0.038***	−0.072
	(−3.7)		(−0.3)		(−13.3)		(−5.8)	
3. Relationship characteristics								
Sales share$_{i,j,t}$			15.701***	0.001	474.878**	0.001	79.946***	0.042
			(4.2)		(2.2)		(5.3)	
Year FE	Yes		Yes		Yes		Yes	
Supplier×Customer FE	Yes		Yes		Yes		Yes	
R^2	0.759		0.955		0.691		0.519	
N. Obs	1,438,918							

This table reports coefficients (Coef.) and measures of economic significance (E.S.) obtained from estimations of Eq. (7), with match-fixed effects, for the four dependent variables given by Eqs (1) to (4). The first dependent variable is multiplied by 1,000. The economic significance measures, E.S., consider the differences in effects on the dependent variables as given by a shift from the 10th percentile value of an explanatory variable's distribution to the 90th percentile value. Variable definitions are provided in Table 2. t-values calculated using robust standard errors, clustered at the supplier-level, are reported within parenthesis. ***, **, * denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

TABLE 6

DETERMINANTS OF CONTRACT CHARACTERISTICS—SUPPLIER- AND CUSTOMER-FE

	Dependent variables:							
	Contracts' size$_{i,j,t}$/ *Assets*$_{j,t}$		Log[*Net days*$_{i,j,t}$]		*Days overdue*$_{i,j,t}$		*Late payment*$_{i,j,t}$ (0/1)	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Variables	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.
1. Supplier characteristics								
Log[*N. Emp.*$_{i,t-1}$]	5.486***	0.215	0.014***	0.018	0.092**	0.005	0.009***	0.111
	(4.7)		(3.8)		(2.1)		(5.6)	
Div$_{i,t-1}$ (0/1)	4.085	—	0.004	—	−0.232	—	0.015	—
	(0.9)		(0.5)		(−1.2)		(1.6)	
Tangible assets/Assets$_{i,t-1}$	−66.053	—	−0.245	—	−0.187	—	−0.026	—
	(−0.9)		(−1.1)		(−0.1)		(−0.3)	
High Rating$_{i,t-1}$ (0/1)	3.511	—	0.017	—	−0.163	—	0.004	—
	(0.8)		(1.5)		(−1.2)		(0.3)	
Cash/Assets$_{i,t-1}$	34.912	—	0.197	—	−0.369	—	0.016	—
	(1.4)		(1.2)		(−0.3)		(0.5)	
EBITDA/Assets$_{i,t-1}$	−26.350	—	−0.116*	−0.011	−1.677	—	−0.073	—
	(−0.6)		(−1.7)		(−1.1)		(−0.9)	
2. Customer characteristics								
Log[*N. Emp.*$_{j,t-1}$]	−1.047**	−0.031	0.005***	0.005	0.195***	0.008	0.007***	0.064
	(−2.0)		(3.7)		(5.8)		(2.8)	
Div$_{j,t-1}$ (0/1)	−1.368***	−0.041	0.000	–	−0.219***	−0.009	−0.006***	−0.057
	(−2.8)		(0.6)		(−13.8)		(−3.4)	
Tangible assets/Assets$_{j,t-1}$	−9.790**	−0.050	0.005	—	0.042	—	0.001	—
	(−2.1)		(1.7)		(0.5)		(0.2)	
High Rating$_{j,t-1}$ (0/1)	−0.380	—	0.002	—	−0.077***	−0.003	−0.001	—
	(−0.5)		(1.4)		(−3.6)		(−0.9)	
Cash/Assets$_{j,t-1}$	−6.557*	−0.045	−0.001	—	−1.248***	−0.011	−0.031***	−0.066
	(−1.8)		(−0.3)		(−12.1)		(−4.0)	
EBITDA/Assets$_{j,t-1}$	−6.279***	−0.043	−0.001	—	−1.518***	−0.014	−0.042***	−0.090
	(−5.0)		(−0.4)		(−12.0)		(−6.9)	
3. Relationship characteristics								
Same County$_{i,j}$ (0/1)	−0.014	—	−0.002	—	0.042	—	0.009**	0.086
	(−0.0)		(-0.5)		(0.5)		(2.2)	
Relationship length$_{i,j,t}$	4.254***	0.357	−0.004**	−0.011	−0.018	—	0.004***	0.106
	(4.7)		(−2.6)		(−0.9)		(3.0)	
Sales share$_{i,j,t}$			57.906***	0.014	59.162	—	126.126***	0.288
			(5.2)		(0.4)		(10.5)	
Year FE	Yes		Yes		Yes		Yes	
Supplier FE	Yes		Yes		Yes		Yes	
Customer FE	Yes		Yes		Yes		Yes	
R^2	0.492		0.778		0.486		0.339	
N. Obs	1,438,918							

This table reports coefficients (Coef.) and measures of economic significance (E.S.) obtained from estimations of Eq. (7), with supplier- and customer-fixed effects, for the four dependent variables given by Eqs (1) to (4). The first dependent variable is multiplied by 1,000. The economic significance measures, E.S., consider the differences in effects on the dependent variables as given by a shift from the 10th percentile value of an explanatory variable's distribution to the 90th percentile value. Variable definitions are provided in Table 2. t-values calculated using robust standard errors, clustered at the supplier-level, are reported within parenthesis. ***, **, * denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

TABLE 7

DETERMINANTS OF THE COMPOSITE MEASURES

	Dependent variables:							
	Contracted credit$_{i,j,t}$/ *Assets*$_{j,t}$		*Realized credit*$_{i,j,t}$/ *Assets*$_{j,t}$		*Contracted credit*$_{i,j,t}$/ *Assets*$_{j,t}$		*Realized credit*$_{i,j,t}$/ *Assets*$_{j,t}$	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Variables	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.
1. Supplier characteristics								
Log[*N. Emp.*$_{i,t-1}$]	0.392***	0.192	0.430***	0.195	0.336***	0.181	0.372***	0.185
	(3.3)		(3.4)		(3.4)		(3.6)	
Div$_{i,t-1}$ (0/1)	0.347	—	0.378	—	0.272	—	0.301	—
	(1.0)		(1.0)		(0.8)		(0.8)	
Tangible assets/Assets$_{i,t-1}$	−2.125	—	−2.421	—	−2.875	—	−3.315	—
	(−0.3)		(−0.3)		(−0.5)		(−0.5)	
High Rating$_{i,t-1}$ (0/1)	0.578	—	0.576	—	0.442	—	0.433	—
	(1.6)		(1.5)		(1.6)		(1.4)	
Cash/Assets$_{i,t-1}$	3.663	—	3.839	—	2.829	—	2.991	—
	(1.4)		(1.4)		(1.4)		(1.4)	
EBITDA/Assets$_{i,t-1}$	−1.985	—	−2.261	—	−1.921	—	−2.153	—
	(−0.6)		(−0.7)		(−0.7)		(−0.7)	
2. Customer characteristics								
Log[*N. Emp.*$_{j,t-1}$]	0.011	—	0.021	—	−0.053	—	−0.053	—
	(0.2)		(0.3)		(−1.3)		(−1.1)	
Div$_{j,t-1}$ (0/1)	−0.102**	−0.042	−0.126**	−0.048	−0.093**	−0.039	−0.117***	−0.045
	(−2.4)		(−2.7)		(−2.5)		(−2.9)	
Tangible assets/Assets$_{j,t-1}$	−0.789*	−0.035	−0.831*	−0.034	−0.773**	−0.054	−0.825**	−0.053
	(−1.9)		(−1.9)		(−2.2)		(−2.2)	
High Rating$_{j,t-1}$ (0/1)	−0.050	—	−0.047	—	−0.027	—	−0.027	—
	(−1.0)		(−0.9)		(−0.5)		(−0.4)	
Cash/Assets$_{j,t-1}$	−0.672*	−0.050	−0.801*	−0.055	−0.503*	−0.047	−0.634*	−0.055
	(−1.8)		(−2.0)		(−1.8)		(−2.0)	
EBITDA/Assets$_{j,t-1}$	−0.395***	−0.033	−0.652***	−0.050	−0.446***	−0.042	−0.695***	−0.060
	(−3.8)		(−6.4)		(−5.1)		(−7.1)	
3. Relationship characteristics								
Same County$_{i,j}$ (0/1)					0.028	—	0.044	—
					(0.3)		(0.4)	
Relationship length$_{i,j,t}$					0.325***	0.376	0.347***	0.370
					(4.5)		(4.4)	
Year FE	Yes		Yes		Yes		Yes	
Supplier×Customer FE	Yes		Yes					
Supplier FE					Yes		Yes	
Customer FE					Yes		Yes	
R^2	0.442		0.444		0.482		0.484	
N. Obs	1,438,918							

This table reports coefficients (Coef.) and measures of economic significance (E.S.) obtained from estimations of Eq. (7) for the two dependent variables given by Eqs (5) and (6). Columns (I) to (IV) report results for models with match-fixed effects and Columns (V) to (VIII) report results for regressions with supplier- and customer-fixed effects. The dependent variables are multiplied by 1,000. The economic significance measures, E.S., consider the differences in effects on the dependent variables as given by a shift from the 10th percentile value of an explanatory variable's distribution to the 90th percentile value. Variable definitions are provided in Table 2. t-values calculated using robust standard errors, clustered at the supplier-level, are reported within parenthesis. ***, **,* denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

TABLE 8

AGGREGATE BALANCE SHEET MEASURES

	Dependent variables:					
	Accounts payable$_{j,t}$/ *Assets*$_{j,t}$		*Input costs*$_{j,t}$/ *Assets*$_{j,t}$		*Accounts payable*$_{j,t}$/ *Input costs*$_{j,t}$	
	(I)	(II)	(III)	(IV)	(V)	(VI)
Variables	Coef.	E.S.	Coef.	E.S.	Coef.	E.S.
1. Customer characteristics						
Log[*N. Emp.*$_{j,t-1}$]	0.009^{***}	0.036	0.138^{***}	0.047	-0.004^{***}	-0.020
	(19.6)		(30.0)		(-9.3)	
Div$_{j,t-1}$ (0/1)	-0.003^{***}	-0.025	-0.020^{***}	-0.014	-0.002^{***}	-0.021
	(-7.8)		(-8.4)		(-7.1)	
Tangible assets/Assets$_{j,t-1}$	-0.044^{***}	-0.053	-0.719^{***}	-0.073	0.000	0.000
	(-29.5)		(-48.3)		(0.3)	
High Rating$_{j,t-1}$ (0/1)	-0.004^{***}	-0.033	-0.047^{***}	-0.033	-0.001^{***}	-0.010
	(-12.9)		(-20.3)		(-3.0)	
Cash/Assets$_{j,t-1}$	-0.032^{***}	-0.061	-0.418^{***}	-0.067	-0.006^{***}	-0.014
	(-28.9)		(-37.8)		(-6.7)	
EBITDA/Assets$_{j,t-1}$	-0.026^{***}	-0.054	-0.263^{***}	-0.046	-0.012^{***}	-0.031
	(-26.5)		(-27.0)		(-16.7)	
Year FE	Yes		Yes		Yes	
Customer FE	Yes		Yes		Yes	
R^2	0.647		0.846		0.625	
N. Obs.	855,258		812,234		811,475	

This table reports coefficients (Coef.) and measures of economic significance (E.S.) for regresions conducted at the customer-level. The dependent variable in Columns (I) and (II) is accounts payable over total assets. The dependent variable in Columns (III) and (IV) is input costs over total assets. The dependent variable in Columns (V) and (VI) is accounts payable over input costs. The economic significance measures, E.S., consider the differences in effects on the dependent variables as given by a shift from the 10th percentile value of an explanatory variable's distribution to the 90th percentile value. Variable definitions are provided in Table 2. t-values calculated using robust standard errors, clustered at the firm-level, are reported within parenthesis. ***, **,* denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

Table 9

ALTERNATIVE SPECIFICATIONS

	Dependent variables:							
	Realized credit$_{i,j,t}$/*Assets*$_{j,t}$						*Realized credit*$_{i,j,t}$/*Sales*$_{j,t}$	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Variables	Coef.	E.S.	Coef.	E.S.	Coef.	E.S.	Coef.	E.S.
1. Supplier characteristics								
Log[*N. Emp.*$_{i,t-1}$]	0.261	—					0.170***	0.175
	(1.6)						(4.0)	
Log[*Sales*$_{i,t-1}$]					0.511***	0.204		
					(3.8)			
Div$_{i,t-1}$ (0/1)	0.555	—			0.435	—	0.189	—
	(0.8)				(1.1)		(1.2)	
Tangible assets/Assets$_{i,t-1}$	8.401	—			−1.893	—	−1.703	—
	(1.4)				(−0.3)		(−0.6)	
High Rating$_{i,t-1}$ (0/1)	−0.544	—			0.620	—	0.183	—
	(−0.8)				(1.6)		(1.4)	
Cash/Assets$_{i,t-1}$	−0.385	—			4.090	—	0.986	—
	(−0.2)				(1.6)		(1.1)	
EBITDA/Assets$_{i,t-1}$	−1.823	—			−2.152	—	−1.206	—
	(−0.5)				(−0.7)		(−0.8)	
2. Customer characteristics								
Log[*N. Emp.*$_{j,t-1}$]	−0.780***	−0.934	0.093	—			−0.388***	−0.300
	(−4.3)		(1.1)				(−11.3)	
Log[*Sales*$_{j,t-1}$]					0.076	—		
					(0.7)			
Div$_{j,t-1}$ (0/1)	−0.307***	−0.118	−0.156***	−0.060	−0.129**	−0.050	−0.057***	−0.045
	(−4.7)		(−3.7)		(−2.6)		(−3.8)	
Tangible assets/Assets$_{j,t-1}$	−2.829***	−0.603	−0.864*	−0.035	−0.825*	−0.053	−0.236*	−0.032
	(−2.9)		(−1.9)		(−1.9)		(−1.9)	
High Rating$_{j,t-1}$ (0/1)	−0.936***	−0.360	−0.006	—	−0.049	—	0.013	—
	(−5.0)		(−0.2)		(−0.9)		(0.5)	
Cash/Assets$_{j,t-1}$	−0.840*	−0.177	−0.911**	−0.062	−0.782*	−0.068	0.229***	0.041
	(−2.0)		(−2.0)		(−2.0)		(2.7)	
EBITDA/Assets$_{j,t-1}$	−0.548**	−0.074	−0.614***	−0.047	−0.712***	−0.062	−0.490***	−0.088
	(−2.3)		(−6.5)		(−7.6)		(−5.2)	

Table 9—Continued

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
3. Relationship characteristics								
Same Countryi,j (0/1)	0.165	—					0.003	0.002
	(0.6)						(0.1)	
Relationship lengthi,j,t	0.483**	0.817					0.151***	0.334
	(2.6)						(4.6)	
Year FE	Yes				Yes		Yes	
Supplier industry FE	Yes							
Customer industry FE	Yes							
Supplier×Customer FE			Yes		Yes		Yes	
Supplier×Year FE			Yes					
R^2	0.086		0.799		0.758		0.496	
N. Obs.	1,438,918							

This table reports results from estimations from five versions of Eq. (7): the first model specification includes year-, one-digit supplier industry-, and one-digit customer industry-fixed effects (Columns (I) and (II)); the second model specification includes supplier*customer- and supplier*year-fixed effects (Columns (III) and (IV)); the third model specification is a version of our baseline specification where size is measured by sales (Columns (V) and (VI)); and the final model specification is a version of our baseline specification where the dependent variable is Realized credit scaled by customer sales (Columns (VII) and (VIII)). Variable definitions are provided in Table 2. t-values calculated using robust standard errors, double clustered at the supplier- and customer-level, are reported within parenthesis. ***, **,* denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

Appendix

TABLE A1

CONTRACT-LEVEL REGRESSIONS WITH MATCH-FE

	Dependent variables:					
	Contract size$_{i,j,c,t}$/ *Assets*$_{j,t}$		Log[*Net days*$_{i,j,c,t}$]		*Days overdue*$_{i,j,c,t}$	
	(I)	(II)	(III)	(IV)	(V)	(VI)
Variables	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.
1. Supplier characteristics						
Log[*N. Emp.*$_{i,t-1}$]	0.017	—	0.003	—	0.121	—
	(1.2)		(0.7)		(1.7)	
Div$_{i,t-1}$ (0/1)	0.028	—	-0.011^{**}	-0.011	-0.112	—
	(1.0)		(-2.1)		(-1.1)	
Tangible assets/Assets$_{i,t-1}$	-1.040^{*}	-0.071	0.055	—	0.466	—
	(-2.0)		(0.5)		(0.2)	
High Rating$_{i,t-1}$ (0/1)	-0.079	—	0.007	—	0.035	—
	(-1.6)		(1.0)		(0.4)	
Cash/Assets$_{i,t-1}$	-0.226	—	-0.040	—	-1.203^{**}	-0.003
	(-1.0)		(-1.1)		(-2.1)	
EBITDA/Assets$_{i,t-1}$	-0.050	—	0.091^{**}	0.008	-4.592^{***}	-0.014
	(-0.1)		(2.6)		(-3.3)	
2. Customer characteristics						
Log[*N. Emp.*$_{j,t-1}$]	-0.081^{***}	-0.037	0.027^{**}	0.011	0.045	—
	(-6.5)		(2.6)		(0.2)	
Div$_{j,t-1}$ (0/1)	-0.026^{***}	-0.029	0.023^{***}	0.023	-0.297^{***}	-0.010
	(-4.8)		(4.2)		(-4.9)	
Tangible assets/Assets$_{j,t-1}$	-0.308^{***}	-0.037	0.009	—	0.125^{*}	0.000
	(-4.5)		(1.3)		(2.0)	
High Rating$_{j,t-1}$ (0/1)	0.009	—	0.004	—	-0.059	—
	(1.7)		(1.3)		(-1.0)	
Cash/Assets$_{j,t-1}$	-0.070	—	-0.028^{***}	-0.005	-1.468^{***}	-0.009
	(-1.5)		(-2.8)		(-2.8)	
EBITDA/Assets$_{j,t-1}$	-0.213^{***}	-0.047	0.022	—	-1.478^{***}	-0.010
	(-3.1)		(1.2)		(-3.5)	
3. Relationship characteristics						
Sales share$_{i,j,t}$			-0.163	—	-0.511	—
			(-0.3)		(-0.1)	
Year FE	Yes		Yes		Yes	
Supplier×Customer FE	Yes		Yes		Yes	
R^2	0.582		0.857		0.365	
N. Obs	52,958,622					

This table reports coefficients (Coef.) and measures of economic significance (E.S.) obtained from estimations of Eq. (7), with match-fixed effects, for the dependent variables at the contract-level. The first dependent variable is multiplied by 1,000. The economic significance measures, E.S., consider the differences in effects on the dependent variables as given by a shift from the 10th percentile value of an explanatory variable's distribution to the 90th percentile value. Variable definitions are provided in Table 2. t-values calculated using robust standard errors, clustered at the supplier-level, are reported within parenthesis. ***, **, * denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

TABLE A2

CONTRACT-LEVEL REGRESSIONS WITH SUPPLIER- AND CUSTOMER-FE

	Dependent variables:					
	Contract size$_{i,j,c,t}$/*Assets*$_{j,t}$		Log[*Net days*$_{i,j,c,t}$]		*Days overdue*$_{i,j,c,t}$	
	(I)	(II)	(III)	(IV)	(V)	(VI)
Variables	Coef.	E. S.	Coef.	E. S.	Coef.	E. S.
1. Supplier characteristics						
Log[*N. Emp.*$_{i,t-1}$]	0.021	—	0.009**	0.012	0.135**	0.006
	(1.3)		(2.2)		(2.0)	
Div$_{i,t-1}$ (0/1)	0.033	—	−0.014**	−0.014	−0.150	—
	(1.0)		(−2.2)		(−1.5)	
Tangible assets/Assets$_{i,t-1}$	−1.059*	−0.082	0.114	—	0.378	—
	(−2.0)		(1.0)		(0.2)	
High Rating$_{i,t-1}$ (0/1)	−0.074*	−0.083	0.008	—	0.022	—
	(−1.7)		(0.9)		(0.2)	
Cash/Assets$_{i,t-1}$	−0.239	—	0.014	—	−1.089	—
	(−1.1)		(0.3)		(−1.7)	
EBITDA/Assets$_{i,t-1}$	−0.011	—	0.086*	0.008	−4.563***	−0.015
	(−0.0)		(2.0)		(−3.2)	
2. Customer characteristics						
Log[*N. Emp.*$_{j,t-1}$]	−0.088***	−0.095	0.037***	0.036	−0.015	—
	(−7.4)		(3.7)		(−0.1)	
Div$_{j,t-1}$ (0/1)	−0.036***	−0.040	0.025***	0.025	−0.336***	−0.011
	(−5.4)		(3.8)		(−5.5)	
Tangible assets/Assets$_{j,t-1}$	−0.318***	−0.060	0.012	—	0.126**	0.001
	(−4.9)		(1.7)		(2.5)	
High Rating$_{j,t-1}$ (0/1)	0.004	—	0.003	—	−0.096	—
	(0.5)		(1.5)		(−1.4)	
Cash/Assets$_{j,t-1}$	−0.095**	−0.024	−0.022**	−0.005	−1.540***	−0.012
	(−2.2)		(−2.1)		(−3.3)	
EBITDA/Assets$_{j,t-1}$	−0.235***	−0.060	0.033	—	−1.650***	−0.012
	(−3.4)		(1.6)		(−4.0)	
3. Relationship characteristics						
Same County$_{i,j}$ (0/1)	−0.052	−0.058	0.009	—	0.390***	0.013
	(−1.5)		(0.9)		(4.6)	
Relationship length$_{i,j,t}$	0.063***	0.196	0.004	—	−0.022	—
	(5.6)		(1.1)		(−0.7)	
Sales share$_{i,j,t}$			−0.012	—	−1.507	—
			(−0.1)		(−0.9)	
Year FE	Yes		Yes		Yes	
Supplier FE	Yes		Yes		Yes	
Customer FE	Yes		Yes		Yes	
R^2	0.504		0.733		0.310	
N. Obs	52,958,622					

This table reports coefficients (Coef.) and measures of economic significance (E.S.) obtained from estimations of Eq. (7), with supplier- and customer-fixed effects, for the dependent variables at the contract-level. The first dependent variable is multiplied by 1,000. The economic significance measures, E.S., consider the differences in effects on the dependent variables as given by a shift from the 10th percentile value of an explanatory variable's distribution to the 90th percentile value. Variable definitions are provided in Table 2. t-values calculated using robust standard errors, clustered at the supplier-level, are reported within parenthesis. ***, **, * denote statistically distinct from 0 at the 1, 5, and 10 percent level, respectively.

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