

Is trade credit a substitute for relationship lending credit?

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Abstract:

Despite its importance to the funding of small enterprises (SMEs), the question of how trade credit is used has not been fully answered. Recently, Uchida *et al.* (2013) showed that trade creditors can act as relationship lenders. To advance this result, we study the use of trade credit as a substitute for relationship lending credit when firms cannot otherwise obtain such credit. Using a sample of SMEs from the Survey of Italian Manufacturing Firms, we show that when opaque firms seeking relationship credit encounter transactional banks, they retain a greater portion of trade credit in their loans. These firms thus substitute trade credit for their missing relationship credit, because trade creditors are better evaluators of firms than are transactional lenders. The results depend on the size and age of the firm, the nature of the bank, and the size of the firm's banking pool.

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1. Introduction

Trade credit is one of the most important sources of financing for small- and medium-sized enterprises (SMEs). However, while prior literature recognizes that trade credit's importance depends on the country—the part of trade credit in total asset varies across Europe, from 13.28% (Netherlands) to 42% (Italy) (Giannetti, 2003)—and on the banking system and legal infrastructure (Demirgüç-Kunt and Maksimovic, 2002), it has not yet solved the puzzle of how trade credit gets used.

There are two possible explanations for the use of trade credit. The first is the real operation explanation, composed of theories of cost minimization (Ferris, 1981), quality supervision (Smith, 1987), and price discrimination (Brennan *et al.*, 1988). The second is the financial explanation, composed of all theories about the link between trade credit and financial institutions (e.g., Cook, 1999; Alphonse *et al.*, 2004; Casey and O'Toole, 2014). According to these theories, trade creditors are potential debt suppliers who have the advantage of acquiring private information from the firm through strong relationships (e.g., Biais and Gollier, 1997; Ng *et al.*, 1999; Burkart and Ellingsen, 2004). This advantage enables trade creditors to provide credit to bank-constrained firms, as happened during the financial crisis (Casey and O'Toole, 2014).

Uchida *et al.* (2013) link this notion of private information to the classifications of soft and hard information developed by Stein (2002). Private information can be regarded as qualitative information that is transmitted via multiple contacts between suppliers and clients over time, which Stein (2002) calls soft information. According to Uchida *et al.* (2013), trade creditors accumulate soft information about firms through their relationships with them, acquiring information that is not necessarily the same as that known to banks. The authors point out that long relationships between trade creditors and firms allow firms to have access to the same benefits that relationship lenders provide, that is, credit availability when firms are in a downturn (Cuñat, 2007) and easier access to credit renegotiation (Wilner, 2000). The authors in turn develop a “relationship lending” hypothesis: Trade creditors can be regarded as relationship lenders because they accumulate soft information. Berger and Udell (2006) define two types of relationship lending technologies:

- Transaction-based lending based on borrowers' hard information
- Relationship lending, primarily based on borrowers' soft information

Uchida *et al.* (2013) show that trade creditors can become relationship lenders, depending on their relative bargaining power. When buyers are non-dependent on their trade creditors in terms of purchase amounts, trade creditors exhibit the same behavior as relationship lenders. The strength of the relationship between the firm and its supplier is captured by the current measure of relationship lending (Petersen and Rajan, 1994), that is, the relationship length. These findings in turn raise a question: Can trade credit be a funding substitute for opaque firms that cannot obtain bank relationship credit?

According to Berger *et al.* (2005) and Stein (2002), the optimal match is as follows: More opaque (transparent) firms, which emit mostly soft (hard) information, should borrow from smaller (larger) relationship (transactional) banks because such banks can optimally evaluate the information emitted. But in some cases, changes in the bank organization can cause the banks to switch from being relationship organizations to being transactional organizations, resulting in firm–bank mismatches. We note two explanations for this change. First, Bonaccorsi Di Patti and Gobbi (2007) find that bank mergers affect the structural organizations of banks and change the availability of credit. Second, Hale (2011) proves that during periods of financial crisis, banks drastically reduce their relationships with clients and favor transactional lending technology over relationship lending technology. Another potential explanation for mismatching comes directly from firms and their ability to accurately observe bank organizations: Even if firms have the advantage of using relationships to evaluate bank type, their evaluations are not always reliable. Firms can *misperceive* their financial partners, judging them, for example, to be relationship banks, when they are actually transactional. The consequence of these potential changes is that firms can find themselves in a situation where they can't find another relationship bank, and have no choice than to deal with a transactional bank.

The consequence of such mismatches is that banks cannot correctly analyze the information emitted by firms, resulting in a higher probability of misvaluation of the quality of the firm. This misvaluation has impacts: Ferri and Murro (2015) demonstrate that when opaque firms match with transactional banks, their probability of being credit-rationed increases. De Bodt *et al.* (2015) show that not only must these firms pay higher interest rates but also have to attract more creditors before banks will evaluate them correctly. To our knowledge, though authors have studied the consequences of mismatching when firms stay with their banks, researchers have not yet identified a credit *alternative* for firms. We consider the potential for firms to use trade credit as an alternative source of funding.

To test our idea, we examine the tenth wave of the Survey of Italian Manufacturing Firms. This data set presents three main advantages for our analysis: First, it contains accounting information that measures the importance of trade credit to firms' funding. Second, for the first time, it includes a set of questions about bank–firm relationships and perceptions of firms about their banks, allowing us to construct two continuous indicators for lending technology. The first indicator captures the degree of relationship lending, and the second captures the degree of transactional lending. These indicators correspond more closely to reality than previous studies that use discrete measures (i.e., that a bank is relationship or transactional; e.g., Berger and Udell, 2004). Finally, the data set is based on Italian firms; Italy is of interest to us because when bank credit is the most important source of financing in the country for SMEs, trade credit represents an important alternative source of financing—on average 42% of total assets, the highest percentage in Europe (Gianetti, 2003).

Our results show that opaque firms that perceive their banks as transactional have higher levels of trade credit, which empirically confirms our idea that these firms use trade credit as a substitute for relationship lending credit in cases of mismatching. However, this effect holds only for older, larger firms, which have greater capacity for negotiation in comparison with smaller, younger firms. Older, larger, opaque firms increase their proportion of trade credit in cases of mismatching but decrease it when relationship banks evaluate them, because trade credit is more expensive than bank credit when it is correctly evaluated. Finally, we show that firms change their behavior depending on the nature of their banks (national or local) and on the structures of the firms' banking pools.

In Section 2, we provide a survey of trade credit and present our theoretical predictions. In Section 3, we present our data and methodology, and then in Section 4, we report our results. Finally, Section 5 concludes.

2. Related literature and theoretical predictions

Most theories that explain the use of trade credit can be classified in two groups. The first group is composed of theories based on real operations. Ferris (1981) offers the transaction cost minimization theory: Trade credit permits reductions in the cost of delivering multiple goods by assigning unique monthly or quarterly payments. Trade credit also gives firms time to check the quality of products (Smith, 1987). Brennan *et al.* (1988) show that creditworthy customers pay promptly to receive any available discounts, while risky customers find the price of trade

credit to be attractive relative to other options. Trade credit allows firms to manage their inventories and cash flow more easily and according to their need.

The second group includes theories based on financial advantages. These theories propose that trade creditors have some advantages for granting credit that banks do not. For example, Biais and Gollier (1997) develop a model in which trade creditors sometimes acquire private information more easily than banks. This acquisition allows trade creditors to reduce asymmetric information and offer credit to opaque firms when the banks cannot. In this way, trade credit acts as a substitute for bank-credit-constrained firms. Ng *et al.* (1999), McMillan and Woodruff (1999), Cook (1999) among others find similar results, and researchers such as Cuñat (2007) and Lin and Chou (2015) empirically validate this theory. Other researchers show that substitution also becomes more important as firms increase in age and size (Casey and O'Toole, 2014) because older firms are more dependent on trade credit and have better access to it (Klapper *et al.*, 2012).

Burkart and Elligsen (2004), using the model developed by Biais and Gollier (1997), show that the use of trade credit is not a substitute but a complement to bank credit: With the knowledge that trade creditors acquire and manage more private information than they do, banks regard the granting of trade credit as a signal of firm quality and therefore lend to firms that have trade credit. Alphonse *et al.* (2004) empirically validate this hypothesis. Aktas *et al.* (2012) show that the use of trade credit is positively correlated with the quality of the firm.

Compared with banks, trade creditors also have an advantage in managing collateral (Longhofer and Santos, 2003; Frank and Maksimovic, 2005). The collateral taken by trade creditors—goods sold on credit—has a higher value than the collateral taken by banks, because it is not in the nature of banks to manage these kinds of goods. Moreover, a trade creditor can liquidate the goods more easily than a bank.

Long-term relationships with suppliers also present some advantages. Cuñat (2007) shows that long-term buyer-supplier relationships allow the development of shared informal technology that acts as insurance against liquidity shocks; this technology benefits both parties and cannot be provided by other lenders. This production technology depends on the fraction of trade credit in the total credit of the firm. Long-term relationships also allow firms to renegotiate debt more easily with their sellers (Wilner, 2000). Moreover, industrial organization research (e.g., Johnson *et al.*, 2002) shows that trade credit duration affects buyers' payment decisions, such that longer durations lead to credit payments, whereas short durations favor cash payments.

Uchida *et al.* (2013) link all of these theories to relationship lending literature to develop their relationship lending hypothesis. As explained previously, they first compare the private information that trade creditors acquire (e.g., Biais and Gollier, 1997; Burkart and Ellingsen; 2004) with the information defined by Stein (2002) as soft. They show that trade creditors can play exactly the same roles as banks that use relationship lending technology, that is, accumulating and using information. For firms, information production and management generates the same advantages as those generated by relationship lending technology: better access to credit and better credit conditions, even when firms are in a downturn.

Therefore, trade creditors can be relationship lenders in cases of mismatching, and opaque firms may be able to use trade credit as a funding alternative. To avoid being misevaluated and having to increase their numbers of bank creditors, these firms can decide to borrow from their trade creditors, because their trade creditors can evaluate their soft information. If it's the case, we should observe a higher level of trade credit for opaque firms in case of mismatching:

H1: Opaque firms that encounter banks that use transactional lending technology have a higher portion of trade credit than others.

However, trade credit is more expensive than bank credit,¹ and when firms are liquidity-unrestricted and have an access to relationship lending technology, they may favor cheaper bank credit over more expensive trade credit (Biais and Gollier, 1997; Burkart and Ellingsen, 2004). That is, opaque firms have no interest in substituting their bank credit with trade credit when they are correctly evaluated; when they encounter face banks that manage soft information, they should have lower trade credit. Indeed, we should observe a lower level of trade credit in this case.

H2: Opaque firms that encounter banks that use relationship lending technology have a lower portion of trade credit than others.

Klapper *et al.* (2012) and Casey and O'Toole (2014) show that larger and older firms use more trade credit than smaller firms when they are bank-constrained. One explanation suggests that because of their size and longer relationships with suppliers, they can negotiate better trade credit conditions than smaller firms. Another explanation comes from Nilsen (2002), who finds that even when firms are large and old, they do not systematically have access to open-market

¹ A "2/10 net 30" agreement (take 2% discount if the firm pays in 10 days, otherwise pay in 30 days) means an implicit interest rate of 43.9% for firms that do not take the discount (Ng *et al.*, 1999)

credit. But because they need more credit than their banks can provide, they turn to their trade creditors. If it's true, we should observe a higher level of trade credit only for larger and older opaque firms.

However, Berger and Udell (1995) explain that age can be a proxy for firms' publicly available information, such that opaque firms are transformed into transparent firms. As a firm's age increases, the quantity of information available also increases; the firm can more easily use this information and switch to a transactional banking system when relationship lending is not available. Therefore, the use of trade credit should be more important for smaller, younger firms.

H3a: Larger, older, opaque firms that encounter transactional banks are more likely to have a higher portion of trade credit than smaller, younger firms.

H3b: Smaller, younger, opaque firms that encounter transactional banks are more likely to have a higher portion of trade credit than larger, older firms.

Finally, Berger *et al.* (2005) prove that larger national banks have an advantage in managing hard information and that smaller local banks have an advantage in managing soft information because of their respective decision-making organizational structures. Our *NATIONAL* indicator—which equals 1 if the bank is a national bank and 0 if it is a local bank—reflects the firm's perception of the bank's nature *before* any contact or relationship; it is an *ex ante* measure. Our lending technology indicator is the firm's perception of the bank's nature *after* contact and establishment of some relationship; it represents an *ex post* measure of the bank's nature.

Thus there are two possible cases. In the first, the *ex-ante* and *ex post* measures correspond, such that when an opaque firm deals with a national bank, even if the firm perceives the bank to be transactional *ex post*, the firm does not change its behavior, because that perception is what it expects. In the second case, the measures do not correspond, such that when an opaque firm deals with a local bank that is transactional, the result is a mismatch; the firm substitutes trade credit for bank credit.

H4: Opaque firms have a higher portion of trade credit only when they deal with a local bank that they perceive *ex post* to be transactional.

3. Methodology and data

3.1. Survey of Italian Manufacturing Firms

The database comes from the 10th wave of the Survey of Italian Manufacturing Firms (SIMF), conducted in 2007 by the UniCredit banking. It contains information about 5,137 Italian manufacturing firms with more than 10 employees. The strength of this database is its extensive information on firms: balance sheets, income statements, ownership structures, numbers and skill degrees of employees, R&D, internationalization and export, and—of greatest interest—information about firm relationships with the banking system and financial management from the point of view of those firms. By having information about a firm’s main bank and its relationship with that bank, from the point of view of the firm, we can analyze a firm’s choices according to what it *perceives*, rather than according to reality. For a complete description of the data set, see Bartoli *et al.* (2013). We also use information from the Italian National Statistics Office (ISTAT) and from Aiello and Bonanno (2015) to complete our database with macroeconomic variables.

Our sample is composed of 971 firms; Table A1 in the Appendix presents the descriptive statistics (mean and standard deviation). On average, firms have 30 years of existence and 167 employees. The large majority of firms are corporations (96.6%), and more than one-quarter belong to a group or consortium. On average, firms have relationships with 5–6 banks and a relationship length of about 17 years with their main bank, which in about 35% of cases is national.

3.2. Methodology

To test our hypotheses, we use the following model:

$$y_i = \alpha + \beta * soft_i + \gamma * LT_i + \delta * (soft_i * LT_i) + \theta * control + \varepsilon_i , \quad (1)$$

where:

- y_i is the importance of trade credit in firm funding;
- $soft_i$ is a measure of the opaqueness of the firm through the use of soft information during the credit application;
- LT_i is the lending technology used to finance the firm, such that it captures the quantity of soft and hard information managed;
- $soft_i * LT_i$ is the interaction term between those variables;
- $control$ is a vector of control variables; and

- ε_i a vector of heteroskedastic-robust standard errors.

3.3. Variables

3.3.1. Trade credit, lending technology, and soft information

We seek to explain the use of trade credit by the type of information used by the firm and the lending technology used by the bank. The use of trade credit can be divided into two terms: quantity and duration. As a measure of the quantity of trade credit, we use three possible proxies:

- TC/TL, which is the ratio of the amount of trade credit to the total loan for the firm at the end of December 2006;
- TC/TA, which is the ratio of the amount of trade credit to the total assets for the firm at the end of December 2006; and
- TC/STL, which is the ratio of the amount of trade credit to total outstanding short-term loans at the end of December 2006.

As a measure of the duration of trade credit, we use the days payable outstanding (DPO). This ratio measures how long it takes for the firm to pay its invoices from its suppliers, equal to:

$$DPO = \frac{\text{average trade payable}_{2006}}{\text{cost of goods sold}_{2006}} * 360.$$

The higher the ratio, the more important it is that the firm is liquid. Because all our dependent variables are continuous variables, we use ordinary least square models in all cases.

With regard to lending technology, we use the methodology of Bartoli *et al.* (2013) to develop two indicators: one for transactional lending technology (LT_TRANS) and one for relationship lending technology (LT_REL). To capture what kind of lending technology firm respondents believe their banks use, we ask, “In your view, what criteria does your bank follow in granting loans to you?” Firm respondents must provide a weight of 1 (very much) to 4 (nil) for 15 items. Table 1 displays the items, the distribution of the answers for each item, and the manner in which each item is classified in the construction of the indicators.

The respondents believe the most important criteria are accounting criteria: Approximately 20% of the sample chose 1 (very important) for criteria 1–4, whereas other items were chosen by about 10% of the sample. Thus, firm respondents believe that banks use more accounting information than other information.

Table 1: Items used to construct our lending technology indicators

This table displays the 15 items used to answer to the question “*In your view, what criteria does your bank follow in granting loans to you?*” the distribution of the answers for each item from 1 (very important) to 4 (nil), and how each item is classified to construct the lending technology indicators, i.e., relationship (R) or transactional (T).

Items	1	2	3	4	T/R
1. Ability of the firm to repay its debt (e.g., years needed to repay its debt)	20.39%	44.73%	8.55%	25.33%	T
2. Financial solidity of the firm (capital/asset ratio)	20.29%	47.37%	7.11%	25.23%	T
3. Firm’s profitability (current profits/sales ratio)	18.23%	44.80%	10.09%	26.88%	T
4. Firm’s growth (growth of sales)	18.74%	41.92%	13.59%	25.75%	T
5. Ability of the firm to post real estate (not personal) collateral	9.89%	41.40%	18.64%	30.07%	T
6. Ability of the firm to post tangible non-real estate collateral	8.24%	42.43%	18.54%	30.79%	T
7. Support by a guarantee association (e.g., loan, export, R&D)	13.18%	31.31%	15.14%	40.37%	
8. Personal guarantees by the firm’s manager or owner	11.33%	46.14%	9.27%	33.26%	T
9. Managerial ability on the part of those running the firm’s business	12.46%	49.02%	11.12%	27.39%	R
10. Strength of the firm in its market (number of customers, commercial network)	10.71%	44.49%	15.65%	29.15%	R
11. Intrinsic strength of the firm (e.g., ability to innovate)	14.93%	44.59%	13.18%	27.29%	R
12. Firm’s external evaluation or its evaluation by third parties	10.61%	44.39%	16.27%	28.73%	
13. Length of the lending relationship with the firm	11.33%	48.20%	13.29%	27.19%	R
14. Loans granted when the bank is the firm’s main bank	11.33%	50.98%	9.17%	28.53%	R
15. Fiduciary bond between the firm and the credit officer at your bank	11.49%	49.54M	11.12%	25.85%	R

With regard to transactional lending technology, Berger and Udell (2006) consider six possible transaction-based lending technologies: financial statements, small business credit scoring, asset-based lending, factoring, fixed-asset lending, and leasing. Unfortunately, the survey provides information for only three of these technologies: financial statements (items 1–4), real estate (item 5), and other fixed assets (items 6–8). We construct an aggregate variable (LT_TRANS), equal to the average of seven dummy variables, which takes a value of 1 if the firm assigned a value of 1 to the previous lending items. The higher the variable, the more the firm regards its bank as transactional.

With regard to relationship lending technology, Berger and Udell (2006) explain that it is primarily based on soft information and developed through contact over time. It represents qualitative information about the firm, such as manager reliability or the intrinsic strength of the firm (Stein, 2002). We focus on all items that can correspond to one of these characteristics: items 9, 10, 11, 13, 14, and 15. The aggregate variable (LT_REL) is equal to the average of six

dummy variables and takes a value of 1 if the firm respondent answers 1 in response to the lending items.

We construct our indicator of opaqueness by capturing the emission of soft information by the firm during the credit application, using a methodology similar to that adopted by Uchida *et al.* (2012) and Bartoli *et al.* (2013). We assume that the firm, knowing whether it emits soft information, chooses its bank accordingly. Therefore, we ask, “Which characteristics are key in selecting your main bank?” Firm respondents must provide a weight ranging from 1 (very important) to 4 (nil) for 14 items, as detailed in Table 2.

Table 2: Items used to construct our soft indicator

This table displays the 14 items used to answer to the question “Which characteristics are key in selecting your main bank?” and the distribution of the answer for each item, from 1 (very important) to 4 (nil).

Items	1	2	3	4
1. The bank knows you and your business.	25.64%	45.21%	4.12%	25.03%
2. The bank knows a member of your Board of Directors or the owners of the firm.	13.49%	52.63%	7.83%	26.06%
3. The bank knows your sector.	14.83%	51.80%	8.65%	24.72%
4. The bank knows your local economy.	11.74%	55.61%	7.93%	24.72%
5. The bank knows your relevant market.	9.37%	54.58%	9.99%	26.06%
6. You have frequent contacts with the credit officer at the bank.	14.93%	50.26%	9.99%	24.82%
7. The bank takes quick decisions.	18.33%	44.70%	12.77%	24.20%
8. The bank offers a large variety of services.	18.23%	49.33%	8.14%	24.30%
9. The bank offers an extensive international network.	14.62%	44.90%	14.11%	26.36%
10. The bank offers efficient internet-based services.	12.67%	46.24%	14.32%	26.78%
11. The bank offers stable funding.	11.74%	47.27%	13.08%	27.91%
12. The bank offers funding and services at low cost.	13.80%	43.36%	14.52%	28.32%
13. The bank’s criteria to grant credit are clear.	13.70%	46.04%	14.62%	25.64%
14. The bank is conveniently located.	16.48%	46.76%	11.23%	25.54%

The most important characteristics for the firm is the first item: “The bank knows you and your business” (25.64% of the sample). This finding reveals the importance, to the firm, of its relationship with its bank. The two next most important characteristics are the seventh and the eighth items (respectively, 18.33% and 18.23%); both show that one of the first preoccupations of customers is to not lose time with banks. They want a quick-acting bank that can provide all the services they want.

To construct our indicator, we choose two items:

1. The bank knows you and your business.
6. You have frequent contacts with the credit officer at the bank.

The variable *SOFT* is a dummy that takes the value of 1 if the firm respondent answers 1 for both these items. In our sample, 8.65% of firms use mostly soft information when they conduct business with their banks.

Table A2 in the Appendix displays the correlation matrix between our dependent variables and our lending technology and information indicators. Except for the DPO, our lending technology and soft indicators never correlate with our dependent variables. In the case of DPO, correlations are positive and significant with our *SOFT* and *LT_REL* indicators. With regard to the lending technology and information indicators, the indicators *LT_TRANS* and *LT_REL* are significantly and positively correlated, a result that supports Bartoli *et al.*'s (2013) finding that relationship and transactional lending technologies are complementary. Finally, the emission of soft information is correlated with the perception of type of bank (transactional or relationship).

3.4. Control variables

We include three additional types of control variables: bank controls, firm controls, and macroeconomic controls. For the bank variables, we define a dummy, *NATIONAL*, equal to 1 if the main bank is a national bank or a foreign bank, and 0 if the main bank is a smaller mutual bank, larger-sized cooperative bank, savings bank, or other type of bank. For the firm variables, we control for several characteristics:

- Firm quality, using the leverage and the profit of the firm.
- Portion of firm's total assets that are fixed assets (*FA/TA*) and *AUDIT*, equal to 1 if the firm has a certified accounting statement (potential hard information emitted).
- Firm size, using the logarithm of the firm age and the logarithm of the number of employees.
- Firm's relationship with financial institutions, controlling for the logarithm of the number of institutions the firm deals with, *Log(Bank)*; the distance between the firm and its main bank, *Distance*; the length of relationship between them, *Rel. Length*; and whether the firm has already been rationed by its bank, *Credit Rationed*.
- Whether the firm belongs to a group or a consortium, using two dummies *GROUP* and *CONSORTIUM* that equal 1 if they belong (membership can represent an alternative source of funding).
- Firm's legal form, using the dummy variable, *CORPORATION*, equal to 1 if the firm is a Corporation.

- Firm's geographic location, using a dummy variable for each of the 101 provinces in Italy.
- Firm's sector, including a dummy variable for each of the six sectors represented in the database: agriculture, wholesale, construction, industrial production, service, and transport.

The final group of control variables is composed of macroeconomic variables. First, we control for the economic environment and investment opportunities using the gross domestic product (GDP) of the province in which the firm is located (Niskanen and Niskanen, 2006) and the loans/deposit ratio, which is a proxy for the traditional function of banks, that is, the transformation of deposits into loans (Aiello and Bonanno, 2015). The higher the ratios, the better the economy, and the higher the opportunities for investment. Second, we include banking sector variables in the Herfindahl-Hirschman index, based on the number of branches per bank in every province, to control for bank competition that can impact the use of trade credit (Demirgüç-Kunt and Maksimovic, 2002). Third, to control for judicial efficiency, we add the number of civil suits pending in each judicial district in Italy (Herrera and Minetti, 2006); more of civil suits implies a more inefficient legal system (Bianco *et al.*, 2005).

4. Results

4.1. Trade credit, opaque firms, and matching

Tables A3, A5, A7, and A9 provide results about the determinants of trade credit for the dependent variables TC/TL , TC/TA , TC/STL , and DOP , respectively.

The interaction term $SOFT * LT_TRANS$ is positive and highly significant (Column 1) for all dependent variables; neither LT_REL nor LT_TRANS are significant. When faced with transactional banks, opaque firms, emitting mostly soft information, have more trade credit in their loans than others. But for firms that use hard information, it does not change whether they encounter relationship or transactional banks. This finding confirms our first hypothesis: In cases of mismatching, in which opaque firms encounter transactional banks, they substitute trade credit for bank credit. The finding also supports the hypothesis of Uchida *et al.* (2013) that trade creditors can exhibit the same behavior as relationship lenders.

As explained previously, our transactional indicator (LT_TRANS) is composed of three technologies: financial statements, real estate, and other fixed assets. We decomposed our transactional indicator into three sub-indicators, LT_FS , LT_RE , and LT_OF ; respectively, they capture each previous technology. In Columns 2–5, we test Equation 1, replacing our

transactional indicator by each sub-indicator, first separately and then together, to determine whether the substitution is the same for all technologies. Firms substitute their bank loans only when they think their bank manages their financial statement technology (Columns 2 and 5 in Tables A3 and A7) and real-estate technology (Columns 3 and 5 in Tables A3, A5, and A9) but not their fixed-asset technology (Columns 4 and 5 in Tables A3, A5, A7, and A9).

Do opaque firms reduce their quantity or duration of trade credit when they are correctly evaluated? We find only weak evidence. The interaction term $LT_REL * SOFT$ is negative and significant; neither LT_REL nor LT_TRANS is significant (Columns 1 and 5, Table A3), but this is the case only with our dependent variable TC/TL . Therefore, opaque firms in good matches have less trade credit in their total loans, but not for other dependent variables.

To check the robustness of our results, we create two more lending technology indicators: $MAINTRANS$ and $MAINREL$, which capture the main lending technology used by the bank (see Table A1 for a description). Table A11 displays the results of our analysis². We can note that when the technology used is mainly transactional, opaque firms present a higher portion of trade credit than others (columns 1, 3 and 4). This comfort our first hypothesis.

Interestingly, when it's the relationship technology which is mainly used, opaque firms have a lower portion of trade credit than others (all columns) which finally comfort our second hypothesis.

4.2. Subsample analysis: credit availability vs. public information and perception

Our third hypothesis relates to the question of substitution depending on the size and the age of the firm. We seek to determine whether size and age are proxies for credit availability or public information diffusion. To test this hypothesis, we split our sample according to firm size, (number of employees in the firm) and age. We then run Equation 1 for each sub-sample.

Tables A4, A6, A8, and A10 provide the results for TC/TL , TC/TA , TC/STL , and DPO , respectively. In Columns 1 and 2, we split our sample based on the mean number of employees in the sample (138 employees). In Columns 3 and 4, we split the sample according to mean firm age in the sample (30 years).

We find that only older, larger, opaque firms have more trade credit than bank credit in cases of mismatching: The interaction term $SOFT * LT_TRANS$ is positive and significant in Column

² To conserve space, we don't include all control variables in the table, but results are available to any request.

2, whatever the dependent variable, but not in Column 1. This finding confirms H3a, because older, larger firms are more dependent on trade credit and have better access to it. For each dependent variable, the interaction term $SOFT * LT_REL$ also is significant and negative for older, larger firms. These firms have better access to bank credit and can more easily substitute relationship bank credit for trade credit, whereas younger, smaller firms must continue to use trade credit. Therefore, H2 is valid only for older, larger firms.

Our final hypothesis relates to the question of a firm's ex ante versus ex post perceptions of the nature of their bank. Do firms change their behavior if their perception ex ante does not correspond to the ex post reality, leading to mismatches? To answer this question, we split our sample according to the variable *NATIONAL*, which represents the ex-ante perception of the nature of the bank by the firm. We then estimate Equation 1 on each subsample. Columns 5 and 7 of Tables A4, A6, A8, and A10 show the results for national and local banks, respectively. The interaction term $SOFT * LT_TRANS$ is positive and significant only when the firm is faced with a local bank, for dependent variables that measure the quantity of trade credit (TC/TL , TC/TA , TC/STL) but not for the *DPO*. Opaque firms have more trade credit than bank credit in cases of mismatching only if their bank is local. These results show that firms can make mistakes in their ex ante perception of banks, leading to non-intentional mismatching (cf. intentional mismatching when opaque firms go to a national bank), and that they substitute trade credit for bank credit, but others do not. Even when national (local) banks have an advantage in managing hard (soft) information, we have some evidence of local banks managing hard information.

4.3. Control variables

With regard to our first control variable, firm characteristics, we find that the older the firm, the greater the importance of trade credit to firm funding. This result confirms the finding of Casey and O'Toole (2014) that older firms are more reliant on trade credit than younger firms. Because leverage negatively affects the amount of trade credit, the better the quality of the firm, the higher the portion of bank credit in the total loan.

Our macroeconomic variable, banking competition *HHII*, is positive and significant; the higher the concentration, the higher the use of trade credit, consistent with results found by Demirgüç-Kunt and Maksimovic (2002). With regard to our measure of economic investment opportunities, both the variables *Loans/Deposit* and *GDP* are positive and significant. The greater the investment opportunities, the greater the use of trade credit. This result may seem

unexpected,³ but Niskanen and Niskanen (2006) show that high investment opportunities lead to more need for credit than banks can provide; in such conditions, firms also use trade credit.

Finally, with regard to legal system efficiency, the greater the inefficiency of the legal system, the greater the use of trade credit; the variable *Civil suits* is positive and significant. This result is consistent with theory that indicates when the legal system is inefficient and does not protect the banks, the use of bank credit decreases and the use of external funding increases (Demirgüç-Kunt and Maksimovic, 2002).

With regard to the number of bank institutions, we find that the coefficient is negative and significant with regard to the impact on *TC/TL* (Table A3) and on *DPO* (Table A9). With more banks, the use of trade credit declines (in terms of quantity or duration). One potential explanation for this finding is that a greater number of bank partners leads to greater credit availability for firms, because firms can more easily approach different banks, thereby reducing the use of trade credit. However, does the number of banks in a firm's pool have the same impact in cases of mismatching? De Bodt *et al.* (2015) show that a potential consequence of mismatching is the increase in the number of banks approached by firms, to find other banks that are able to evaluate them correctly. But what happens when a firm already has a large pool of banks? To test this idea, we split our sample in two subsamples based on number of banks and run Equation (1) on each subsample. Table A12 provides the results. Columns 1–4 correspond to the results for each dependent variable (*TC/TL*, *TC/TA*, *TC/STL*, and *DPO*, respectively) for subsamples in which firms have pools of three banks or less, and Columns 5–8 display results in which firms have pools of more than three banks.

The interaction term *SOFT * LT_TRANS* is positive and significant only when the firm has a pool of three banks or fewer (Columns 1–4). That is, only opaque firms with a small pool of banks increase their portion of trade credit, because they substitute trade credit for relationship credit in cases of mismatching. This result supports our idea that opaque firms with large banking pools favor credit from other banks over trade credit.

5. Endogeneity of mismatch and trade credit

We are aware that our estimation may be affected by a potential endogeneity problem. We assume that opaque firms, which are in case of mismatching, increase their level of trade credit to avoid to be misevaluated or to have to increase their number of creditors. However, the level

³ The common view is that a high investment opportunity is often associated with better availability of bank credit, leading to less use of external funding (Huyghebaert, 2006).

of trade credit can also drive the relation between the firm and its bank. Opaque firms with a high level of trade credit can decide either not to emit soft information, due to its cost, or can be less careful in their bank choice. The direction of this bias being unclear, we deal with this potential endogeneity using an instrumental variable regression.

In our approach, we need to endogenize both our soft indicator and our lending technology indicators.

To endogenize our soft indicator, we use two instruments: an index of self-confidence of the firm and the length of relationship between the firm and its bank. The index of self-confidence is an average of the dummies constructed on the characteristics 7, 8, 9, 10, 11, 12 and 14 from the question “*In your view, which criteria does your bank follow in granting loans to you?*” (Ferri and Murro, 2015). As explained by the authors, this variable captures “the importance that a firm places on the ex-ante transactional features of its bank”. This means that the higher this variable, the lower the firm needs to emit soft information, since it thinks that even without it, it will obtain the credit. Our second instrument is the length of relationship between the firm and its bank, it’s not established that the longer is the length of relationship, the more important is the emission of soft information by the firm (Petersen and Rajan, 1994; Degryse and Ongena, 2007; among others).

For our lending technology indicators, we use four instruments: Banks’ M&A, Loan Officer Turnover, Functional Distance (Alessandrini *et al.*, 2010) and the mean degree of transactional at a province level. As explained previously, banks’ M&A (*Banks’ M&A*) lead to change the strategy of the bank, therefore a high level of M&A in the province implies high potential changes in the structure of the bank and could lead to mismatching. The second instrument variable is Loan Officer Turnover (*L.O. Turnover*). Hertzberg *et al.* (2010) show that a rotation policy of loan officers in a bank changes the behavior of these loan officers and the information that they use – they focus more on hard information than soft information -, in this way, whatever the perception of the bank by the firm, if the bank decides to change its rotation policy, this could lead to a change in the information used and so a potential mismatching. We also use the *Functional Distance* between hierarchical levels for the banks in the same province of the firm. This variable is equal to the number of branches operating in the province, each weighted by the logarithm of one plus the kilometric distance between the capital of that province and the capitals of provinces where parent banks are headquartered (Alessandrini *et al.*, 2010). A high functional distance leads to deteriorate the potential use of soft information by the bank so can lead to a change in the lending technology used by the bank. And finally we use the mean

degree of transactional at a province level (*Provincial LT_TRANS*), this variable is used to capture potential local effect on the technology used by the bank (Caprio *et al.*, 2007). See Table A1 for a complete description of these variables.

Table A12 displays our results. The first part of the table reports results concerning our three endogenous variables. We can note that an important loan officer turnover leads to increase the probability that the bank use hard information, but decrease the use of soft information. Which is consistent with Hertzberg *et al.* (2010) results. Bank's M&A also impact negatively the use of hard information. Concerning our soft indicator, the length of relationship impact positively the emission of soft information, which is consistent with previous results. Surprisingly, if the Self-Confident index impact the use of soft information, the impact is positive.

Now, if we turn to the second part of the table, we can note that our interaction indicator *SOFT*LT_TRANS* is positive in all columns and significant in columns 1, 3 and 4. This means that the opaquer the firm, the stronger the effect of transactional on the use of trade credit. Interestingly, our interaction indicator *SOFT*LT_REL* which is only significant in case of *TC/TL* is here negative and significant in all columns: the opaquer the firm, the more negative is the impact of relationship on the use of trade credit. Therefore, our results are robust to any endogeneity problem.

6. Conclusion

The motivation of firms to use trade credit has been an important puzzle in finance. There are currently two main explanations: real operations and financial. This study is part of the latter group, pertaining to the strength of firm–supplier relationships formalized by Uchida *et al.* (2013), who show that trade creditors can act as relationship lenders. With this article, we go a step further to ask whether trade credit can substitute for relationship credit when firms cannot otherwise find such credit. Using an Italian database, we find strong evidence that opaque firms that use soft information, faced with transactional banks, have greater portions of trade credit in their global debt. Trade creditors, acting as relationship lenders, are better able to evaluate firms than transactional banks and offer better credit conditions; opaque firms, mismatched with their banks, substitute trade credit for bank credit. Although we find only weak evidence overall that these firms decrease their portions of trade credit when they face relationship banks, as their age or size increase, their probability of reducing their portions of trade credit becomes significant. Older, larger firms may have better access to bank credit; they may more easily substitute bank credit for trade credit when their banks do not correctly evaluate them.

Moreover, we do not find any notable results for firms that produce hard information. Our results hold only for larger, older opaque firms, confirming Klapper *et al.*'s (2012) results with regard to opaque firms that encounter national banks. The findings support the idea that firms can make mistakes in their perceptions of the nature of their banks. Finally, we show that when opaque firms have a small pool of banks, they prefer to search that pool first, before approaching trade creditors.

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Table A1
Descriptive Statistics

The table shows the mean and standard deviation of each variable for a sample of firms in SIMF 2006

Variable	Description	Mean	Std. Dev.
<i>Dependent variables</i>			
TC/TL	Ratio of firm's trade credit to total loans as of the end of December 2006	0.203	0.199
TC/TA	Ratio of firm's trade credit to total assets as of the end of December 2006	0.226	0.247
TC/STL	Ratio of firm's trade credit to total short-term loans as of the end of December 2006	0.433	0.454
DPO	Days payable outstanding (average trade payable/cost of goods sold) * 360	85.55	92.78
<i>Variables of interest</i>			
SOFT	We use the following question of the Survey: "Which characteristics are key in selecting your main bank?" In answering this question, the firm was required to give a value, with descending order of importance, from 1-4, to the two following characteristics (among others): "The bank knows you and your business" and "You have frequent contacts with the credit officer at the bank." The variable Soft is a dummy that takes value one if the firm chose the highest value for both the above two characteristics. (Bartoli <i>et al.</i> , 2013).	0.086	0.281
LT_TRANS	Global index for transactional lending technology; we use a question available in the Survey: "In your view, which criteria does your bank follow in granting loans to you?" In answering this question, the firm was required to give a weight, from 1 (very much) to 4 (nil) to 15 factors. LT_TRANS, is an average of six dummy variables that take a value of 1 if the firm answered "1" to lending factors 1, 2, 3, 4, 5, 6, and 8 respectively. (Bartoli <i>et al.</i> , 2013).	0.130	0.241
LT_FS	Index for financial statement technology; LT_FS is an average of four dummy variables that take a value of 1 if the firm answered "1" to lending factors 1, 2, 3, and 4 respectively (same question as LT_TRANS).	0.194	0.312
LT_RE	Index for real estate technology; LT_RE is a dummy equal to 1 if the firm answered "1" to lending factor 5 (same question as LT_TRANS).	0.099	0.299
LT_OF	Index for other fixed-asset technology; LT_OF is an average of four dummy variables that take a value of 1 if the firm answered "1" to lending factors 6 and 8 (same question as LT_TRANS).	0.098	0.239
LT_REL	Index for relationship lending technology; we use a question available in the Survey: "In your view, which criteria does your bank follow in granting loans to you?" In answering this question, the firm was required to give a weight from 1 (very much) to 4 (nil) to 15 factors. LT_REL, is an average of six dummy variables that take a value of 1 if the firm answered "1" to lending factors 9, 10, 11, 13, 14, and 15 respectively. (Bartoli <i>et al.</i> , 2013).	0.124	0.259
MAINTRANS	1 if LT_TRANS is larger than the 75% percentile of the distribution and LT_REL is lower than 75%	0.339	0.474
MAINREL	1 if LT_REL is larger than the 75% percentile of the distribution and LT_TRANS is lower than 75%	0.042	0.201

Control variables			
<i>Firm variables</i>			
LEVERAGE	Ratio of firm's total loan to total asset as of the end of December 2006/1,000	0.025	0.774
Firm Age	Log(1 + firm age)	3.189	0.758
PROFIT	Log(1+ Profit of the firm as the end of December 2006)	8.958	1.924
FA/TA	Ratio of firm's fixed assets to total assets as the end of December 2006	0.279	0.183
Firm Size	Log(1 + firm number of employees)	3.869	1.317
CORPORATION	1 if the firm is a corporation	0.966	0.181
GROUP	1 if the firm belongs to a group	0.256	0.436
CONSORTIUM	1 if the firm is member of a consortium	0.034	0.181
AUDIT	1 if the firm has certified accounting statement	0.243	0.429
Credit Rationed	Dummy takes a value of 1 if the firm answers "yes" to the question "In 2006 would your firm have wished a larger amount of loans at the prevailing interest rate agreed with the bank?" and "yes" to at least one of the following two questions: "In 2006, did the firm demand more credit than it actually obtained?" and/or "To obtain more credit, were you willing to pay a higher interest rate?" (Survey of Italian Manufacturing Firms)	0.063	0.243
Rel. Length	Log(1 + length of the relationship between the firm and the bank)	2.717	0.677
Log(Bank)	Log(1 + number of banks the firm deals with)	1.748	0.492
Province	Set of dummies for each Italian province (in Italy there are 110 provinces)		
Sector	Set of dummies equal to 1 if the firm belongs one of six sectors: agriculture, wholesale, construction, industrial production, service, transport		
<i>Bank variables</i>			
NATIONAL BANK	1 if the main bank is either a national bank or a foreign bank; 0 if the main bank is a smaller-sized cooperation mutual bank, a larger-sized cooperative banks, a saving bank, or other type of bank	0.352	0.478
<i>Macroeconomic variables</i>			
GDP	Log of the value of the GDP in the province as of the end of December 2006	10.222	0.182
HHI1	Hirschman-Herfindahl index calculated using the number of branches per bank in every province	0.099	0.037
Loans/Deposit	Ratio of deposits in loans at provincial level	1.919	0.570
Civil suits	Average number of civil suits pending in the judicial district in 1998–2000, per 1,000 inhabitants (Herrera and Minetti, 2006)	3.455	5.451
Observations	971		

Table A2
Correlation Matrix

The table provides the pairwise correlation matrix. The number in brackets indicates the p-value of the test of significance: * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

	TC/TL	TC/TA	TC/STL	DPO	SOFT	LT_REL	LT_TRANS
TC/TL	1.0000 [0.0000]						
TC/TA	0.9344*** [0.0000]	1.0000 [0.0000]					
TC/STL	0.9451*** [0.0000]	0.8810*** [0.0000]	1.0000 [0.0000]				
DPO	0.7994*** [0.0000]	0.7945*** [0.0000]	0.7693*** [0.0000]	1.0000 [0.0000]			
SOFT	0.0214 [0.5051]	0.0110 [0.7313]	0.0133 [0.6805]	0.0811** [0.0116]	1.0000 [0.0000]		
LT_REL	0.0346 [0.2814]	0.0335 [0.2964]	0.0394 [0.2209]	0.0579* [0.0720]	0.2062*** [0.0000]	1.0000 [0.0000]	
LT_TRANS	0.0379 [0.2379]	0.0384 [0.2317]	0.0480 [0.1364]	0.0512 [0.1117]	0.1922*** [0.0000]	0.6404*** [0.0000]	1.0000 [0.0000]

Table A3

Determinants of the Portion of Trade Credit in Total Loan

These regressions show the impact of the use of soft information and of lending technologies, divided into four indicators, on the quantity of trade credit in total loan. We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	(1)	(2)	(3)	(4)	(5)
	TC/TL	TC/TL	TC/TL	TC/TL	TC/TL
SOFT	-0.051 [0.117]	-0.059 [0.108]	-0.023 [0.474]	-0.032 [0.319]	-0.051 [0.150]
LT_REL	0.013 [0.780]	0.041 [0.318]	-0.001 [0.986]	0.007 [0.870]	0.026 [0.581]
SOFT * LT_REL	-0.237* [0.077]	-0.087 [0.387]	-0.114 [0.264]	-0.046 [0.665]	-0.249* [0.067]
LT_TRANS	-0.001 [0.980]				
SOFT * LT_TRANS	0.378*** [0.007]				
LT_FS		-0.033 [0.309]			-0.045 [0.187]
SOFT * LT_FS		0.176* [0.061]			0.181** [0.049]
LT_RE			0.019 [0.517]		0.030 [0.358]
SOFT * LT_RE			0.197** [0.020]		0.163* [0.080]
LT_OF				0.010 [0.832]	0.008 [0.874]
SOFT * LT_OF				0.128 [0.219]	0.028 [0.798]
Credit Rationed	0.000 [0.990]	-0.004 [0.879]	0.003 [0.918]	0.002 [0.956]	-0.001 [0.967]
AUDIT	0.003 [0.859]	0.005 [0.750]	0.002 [0.880]	0.003 [0.858]	0.004 [0.818]
Log(bank)	-0.027* [0.099]	-0.027 [0.112]	-0.029* [0.080]	-0.026 [0.116]	-0.029* [0.080]
Rel. Length	-0.005 [0.669]	-0.008 [0.523]	-0.004 [0.740]	-0.005 [0.668]	-0.006 [0.620]

Firm Age	0.038*** [0.001]	0.038*** [0.001]	0.037*** [0.001]	0.038*** [0.001]	0.038*** [0.001]
PROFIT	0.002 [0.648]	0.002 [0.620]	0.002 [0.715]	0.002 [0.623]	0.002 [0.700]
FA/TA	0.038 [0.298]	0.040 [0.279]	0.034 [0.355]	0.040 [0.277]	0.034 [0.362]
Firm Size	-0.004 [0.659]	-0.004 [0.598]	-0.003 [0.740]	-0.004 [0.580]	-0.003 [0.732]
LEVERAGE	-0.011*** [0.000]	-0.011*** [0.000]	-0.011*** [0.000]	-0.011*** [0.000]	-0.011*** [0.000]
CORPORATION	0.050 [0.180]	0.046 [0.215]	0.052 [0.163]	0.044 [0.227]	0.054 [0.148]
GROUPE	-0.020 [0.262]	-0.019 [0.289]	-0.022 [0.229]	-0.020 [0.281]	-0.020 [0.282]
CONSORTIUM	-0.020 [0.600]	-0.017 [0.661]	-0.025 [0.518]	-0.015 [0.697]	-0.023 [0.555]
NATIONAL BANK	0.015 [0.340]	0.014 [0.377]	0.016 [0.319]	0.014 [0.380]	0.016 [0.301]
GDP	0.917** [0.022]	0.895** [0.026]	0.934** [0.021]	0.908** [0.023]	0.935** [0.022]
HHI1	16.569*** [0.002]	16.516*** [0.002]	16.841*** [0.002]	16.071*** [0.003]	17.358*** [0.001]
Loans/Deposit	0.560*** [0.000]	0.566*** [0.000]	0.570*** [0.000]	0.546*** [0.000]	0.588*** [0.000]
Civil Suits	82.448*** [0.000]	83.311*** [0.000]	83.785*** [0.000]	84.928*** [0.000]	82.751*** [0.000]
Province Indicators	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes
Constant	-12.447*** [0.007]	-12.219*** [0.008]	-12.663*** [0.006]	-12.279*** [0.007]	-12.755*** [0.006]
Observations	971	971	971	971	971
R ²	0.146	0.142	0.145	0.140	0.149
Adjusted R ²	0.024	0.018	0.022	0.016	0.022

Table A4

Determinants of the Portion of Trade Credit in Total Loan in Subsamples

These regressions show the impact of the use of soft information and of lending technologies on the quantity of trade in total loan in subsamples based on the number of employees (Columns 1 and 2), age (Columns 3 and 4) and bank type (Columns 5 and 6). We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	By number of employees		By firm age		By bank type	
	≤ mean	> mean	≤ mean	> mean	National	Local
	(1)	(2)	(3)	(4)	(5)	(6)
	TC/TL	TC/TL	TC/TL	TC/TL	TC/TL	TC/TL
SOFT	0.010 [0.848]	-0.094** [0.033]	0.076 [0.303]	-0.116*** [0.002]	-0.050 [0.296]	-0.053 [0.306]
LT_REL	0.044 [0.581]	-0.002 [0.980]	-0.018 [0.785]	0.013 [0.838]	-0.065 [0.379]	0.038 [0.598]
SOFT * LT_REL	0.077 [0.683]	-0.325*** [0.006]	0.098 [0.604]	-0.366*** [0.001]	-0.152 [0.458]	-0.216 [0.203]
LT_TRANS	0.064 [0.394]	-0.061 [0.379]	0.091 [0.233]	-0.038 [0.552]	0.078 [0.362]	-0.047 [0.457]
SOFT * LT_TRANS	-0.076 [0.714]	0.595*** [0.000]	-0.178 [0.405]	0.689*** [0.000]	0.275 [0.208]	0.425** [0.015]
Credit Rationed	0.040 [0.307]	-0.016 [0.746]	-0.002 [0.967]	0.033 [0.485]	0.172** [0.013]	-0.029 [0.413]
AUDIT	-0.008 [0.770]	0.019 [0.420]	0.012 [0.651]	0.010 [0.675]	-0.061 [0.154]	0.017 [0.389]
Log(Bank)	-0.038 [0.237]	-0.017 [0.410]	0.005 [0.867]	-0.031 [0.154]	-0.081** [0.014]	-0.001 [0.950]
Rel. Length	-0.008 [0.662]	-0.002 [0.908]	-0.004 [0.864]	-0.009 [0.561]	0.016 [0.442]	-0.013 [0.409]
Firm Age	0.050*** [0.004]	0.036** [0.021]	0.040 [0.155]	0.041 [0.134]	0.028 [0.171]	0.042*** [0.003]
PROFIT	-0.005 [0.580]	0.008 [0.182]	0.010 [0.145]	0.001 [0.848]	0.008 [0.154]	0.000 [0.989]
FA/TA	0.057	-0.041	0.082	-0.014	0.061	0.028

Firm Size	[0.295]	[0.466]	[0.171]	[0.781]	[0.361]	[0.568]
	-0.031	-0.004	-0.020	0.002	0.001	-0.007
LEVERAGE	[0.164]	[0.789]	[0.103]	[0.829]	[0.958]	[0.575]
	19.695	-0.013***	-39.175	-0.011***	-22.161	-0.010***
CORPORATION	[0.670]	[0.000]	[0.353]	[0.000]	[0.644]	[0.000]
	0.028	0.071	-0.036	0.132***	0.101*	0.050
GROUPE	[0.545]	[0.304]	[0.584]	[0.000]	[0.090]	[0.339]
	-0.008	-0.039*	-0.024	-0.028	-0.038	-0.016
CONSORTIUM	[0.833]	[0.090]	[0.467]	[0.246]	[0.236]	[0.491]
	-0.014	-0.015	-0.039	0.060	-0.054	-0.009
NATIONAL BANK	[0.779]	[0.814]	[0.526]	[0.258]	[0.545]	[0.849]
	0.037	0.023	-0.004	0.030	-	-
GDP	[0.134]	[0.339]	[0.885]	[0.153]		
	0.570	6.062	0.203	1.013**	0.616	0.859
HHI1	[0.738]	[0.109]	[0.899]	[0.049]	[0.281]	[0.594]
	-0.715	4.988***	-3.108**	24.782***	16.523*	2.310
Loans/Deposit	[0.697]	[0.000]	[0.026]	[0.003]	[0.085]	[0.147]
	-0.248	-0.060	-0.242	0.778***	0.495**	-0.087
Civil Suits	[0.432]	[0.849]	[0.398]	[0.000]	[0.028]	[0.770]
	49.050	15.376	-27.600	95.126***	88.163***	36.232
Province Indicators	[0.836]	[0.792]	[0.898]	[0.000]	[0.000]	[0.870]
	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-5.220	-62.909*	-1.182	-14.454**	-9.047	-9.095
	[0.764]	[0.097]	[0.942]	[0.021]	[0.199]	[0.580]
Observations	469	502	426	545	342	629
R ²	0.247	0.252	0.227	0.262	0.332	0.162
Adjusted R ²	0.024	0.051	-0.008	0.076	0.067	-0.020

Table A5

Determinants of the Portion of Trade Credit in Total Assets

These regressions show the impact of the use of soft information and of lending technologies, divided into four indicators, on the quantity of trade credit in total assets. We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	(1)	(2)	(3)	(4)	(5)
	TC/TA	TC/TA	TC/TA	TC/TA	TC/TA
SOFT	-0.057 [0.183]	-0.068 [0.155]	-0.032 [0.455]	-0.041 [0.340]	-0.055 [0.254]
LT_REL	0.001 [0.980]	0.035 [0.474]	-0.011 [0.800]	0.002 [0.971]	0.019 [0.745]
SOFT * LT_REL	-0.190 [0.305]	-0.078 [0.528]	-0.112 [0.429]	0.018 [0.897]	-0.201 [0.280]
LT_TRANS	0.010 [0.870]				
SOFT * LT_TRANS	0.322* [0.095]				
LT_FS		-0.031 [0.445]			-0.047 [0.267]
SOFT * LT_FS		0.171 [0.140]			0.169 [0.150]
LT_RE			0.030 [0.424]		0.042 [0.302]
SOFT * LT_RE			0.199* [0.086]		0.222** [0.048]
LT_OF				0.012 [0.829]	0.004 [0.948]
SOFT * LT_OF				0.046 [0.727]	-0.089 [0.502]
Credit Rationed	0.010 [0.796]	0.005 [0.903]	0.012 [0.741]	0.010 [0.794]	0.008 [0.837]
AUDIT	0.007 [0.723]	0.010 [0.629]	0.007 [0.742]	0.008 [0.704]	0.008 [0.676]
Log(bank)	-0.027 [0.184]	-0.026 [0.199]	-0.029 [0.152]	-0.026 [0.201]	-0.030 [0.141]
Rel. Length	-0.007 [0.638]	-0.010 [0.520]	-0.006 [0.700]	-0.007 [0.617]	-0.008 [0.602]

Firm Age	0.044*** [0.001]	0.045*** [0.001]	0.044*** [0.002]	0.044*** [0.002]	0.044*** [0.001]
PROFIT	0.007 [0.202]	0.007 [0.193]	0.006 [0.238]	0.007 [0.192]	0.006 [0.251]
FA/TA	-0.028 [0.515]	-0.027 [0.539]	-0.033 [0.446]	-0.027 [0.539]	-0.036 [0.417]
Firm Size	-0.012 [0.219]	-0.013 [0.196]	-0.011 [0.269]	-0.013 [0.191]	-0.010 [0.291]
LEVERAGE	-0.013*** [0.000]	-0.013*** [0.000]	-0.013*** [0.000]	-0.013*** [0.000]	-0.012*** [0.000]
CORPORATION	0.057 [0.220]	0.053 [0.247]	0.060 [0.196]	0.052 [0.259]	0.064 [0.173]
GROUPE	-0.015 [0.516]	-0.014 [0.546]	-0.016 [0.478]	-0.015 [0.526]	-0.015 [0.510]
CONSORTIUM	-0.033 [0.478]	-0.030 [0.524]	-0.038 [0.398]	-0.029 [0.536]	-0.039 [0.374]
NATIONAL BANK	0.023 [0.232]	0.022 [0.250]	0.024 [0.209]	0.022 [0.258]	0.025 [0.194]
GDP	1.013* [0.062]	0.993* [0.069]	1.034* [0.058]	1.002* [0.064]	1.039* [0.061]
HHI1	23.953*** [0.002]	23.967*** [0.001]	24.382*** [0.001]	23.547*** [0.002]	25.116*** [0.001]
Loans/Deposit	0.827*** [0.000]	0.835*** [0.000]	0.842*** [0.000]	0.818*** [0.000]	0.869*** [0.000]
Civil Suits	67.732*** [0.000]	68.419*** [0.000]	68.811*** [0.000]	69.933*** [0.000]	67.650*** [0.000]
Province Indicators	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes
Constant	-14.578** [0.020]	-14.373** [0.022]	-14.859** [0.018]	-14.408** [0.021]	-15.020** [0.018]
Observations	971	971	971	971	971
R ²	0.132	0.130	0.134	0.128	0.137
Adjusted R ²	0.008	0.005	0.009	0.003	0.008

Table A6

Determinants of theP of Trade Credit in Total Assets in Subsamples

These regressions show the impact of the use of soft information and of lending technologies on the quantity of trade in total asset in subsamples based on the number of employees (Columns 1 and 2), age (Columns 3 and 4) and bank type (Columns 5 and 6). We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	By number of employees		By firm age		By bank type	
	≤ mean	> mean	≤ mean	> mean	National	Local
	(1)	(2)	(3)	(4)	(5)	(6)
	TC/TA	TC/TA	TC/TA	TC/TA	TC/TA	TC/TA
SOFT	0.005 [0.948]	-0.102* [0.080]	0.117 [0.256]	-0.145*** [0.002]	-0.048 [0.445]	-0.072 [0.260]
LT_REL	-0.001 [0.990]	0.010 [0.900]	-0.075 [0.333]	0.044 [0.599]	-0.051 [0.585]	-0.037 [0.663]
SOFT * LT_REL	0.330 [0.196]	-0.380*** [0.008]	0.249 [0.370]	-0.410*** [0.002]	-0.099 [0.732]	-0.153 [0.421]
LT_TRANS	0.110 [0.253]	-0.085 [0.308]	0.151* [0.095]	-0.058 [0.484]	0.064 [0.551]	-0.017 [0.839]
SOFT * LT_TRANS	-0.316 [0.266]	0.643*** [0.000]	-0.407 [0.186]	0.771*** [0.000]	0.214 [0.467]	0.400* [0.070]
Credit Rationed	0.051 [0.319]	-0.008 [0.904]	-0.001 [0.987]	0.041 [0.486]	0.206** [0.018]	-0.019 [0.663]
AUDIT	-0.003 [0.921]	0.033 [0.274]	0.000 [0.999]	0.037 [0.232]	-0.077 [0.129]	0.024 [0.315]
Log(Bank)	-0.038 [0.330]	-0.018 [0.461]	0.005 [0.891]	-0.029 [0.276]	-0.089** [0.024]	0.005 [0.850]
Rel. Length	-0.016 [0.489]	-0.003 [0.887]	-0.005 [0.868]	-0.017 [0.390]	0.002 [0.928]	-0.013 [0.516]
Firm Age	0.068*** [0.002]	0.040** [0.043]	0.054 [0.128]	0.046 [0.204]	0.036 [0.175]	0.052*** [0.003]
PROFIT	-0.003 [0.776]	0.013** [0.042]	0.013 [0.116]	0.008 [0.249]	0.014** [0.036]	0.005 [0.572]
FA/TA	-0.031	-0.077	0.016	-0.089	-0.031	-0.036

Firm Size	[0.632] -0.047*	[0.269] -0.012	[0.827] -0.029*	[0.138] -0.008	[0.720] -0.005	[0.526] -0.020
LEVERAGE	[0.081] 130.519**	[0.485] -0.014***	[0.060] 18.195	[0.523] -0.012***	[0.743] 90.433	[0.169] -0.012***
CORPORATION	[0.030] 0.044	[0.000] 0.080	[0.721] -0.044	[0.000] 0.153***	[0.171] 0.113	[0.000] 0.060
GROUPE	[0.450] 0.011	[0.388] -0.039	[0.609] -0.001	[0.001] -0.029	[0.160] -0.047	[0.341] -0.007
CONSORTIUM	[0.817] -0.036	[0.177] 0.001	[0.977] -0.035	[0.352] 0.049	[0.250] -0.098	[0.814] -0.017
NATIONAL BANK	[0.552] 0.045	[0.994] 0.040	[0.649] 0.001	[0.441] 0.036	[0.351] -	[0.773] -
GDP	[0.139] 0.336	[0.183] 9.914*	[0.979] -0.037	[0.192] 1.259*	0.418	1.936
HHI1	[0.868] -1.563	[0.085] 6.300**	[0.985] -3.833**	[0.086] 36.790***	[0.508] 20.908**	[0.394] 0.773
Loans/Deposit	[0.455] -0.247	[0.013] -0.186	[0.027] -0.255	[0.002] 1.155***	[0.049] 0.632**	[0.707] -0.276
Civil Suits	[0.519] 24.741	[0.691] -59.126	[0.471] -77.511	[0.000] 84.163***	[0.014] 68.232***	[0.510] 177.270
Province Indicators	[0.929] Yes	[0.500] Yes	[0.770] Yes	[0.000] Yes	[0.000] Yes	[0.563] Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-2.735 [0.895]	-102.097* [0.077]	1.496 [0.941]	-18.823** [0.036]	-7.731 [0.320]	-19.869 [0.390]
Observations	469	502	426	545	342	629
R ²	0.246	0.222	0.219	0.232	0.312	0.157
Adjusted R ²	0.023	0.013	-0.018	0.039	0.039	-0.026

Table A7

Determinants of the part of Trade Credit in Total Short-Term Loan

These regressions show the impact of the use of soft information and of lending technologies, divided into four indicators, on the quantity of trade credit in total short-term loan. We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	(1)	(2)	(3)	(4)	(5)
	TC/STL	TC/STL	TC/STL	TC/STL	TC/STL
SOFT	-0.099 [0.172]	-0.122 [0.130]	-0.048 [0.506]	-0.065 [0.369]	-0.114 [0.154]
LT_REL	0.032 [0.761]	0.118 [0.204]	0.015 [0.853]	0.029 [0.768]	0.070 [0.512]
SOFT * LT_REL	-0.461 [0.144]	-0.219 [0.327]	-0.189 [0.424]	-0.118 [0.627]	-0.513 [0.109]
LT_TRANS	0.044 [0.700]				
SOFT * LT_TRANS	0.691** [0.034]				
LT_FS		-0.063 [0.385]			-0.104 [0.163]
SOFT * LT_FS		0.370* [0.073]			0.407** [0.046]
LT_RE			0.076 [0.286]		0.098 [0.208]
SOFT * LT_RE			0.294 [0.129]		0.185 [0.383]
LT_OF				0.056 [0.614]	0.033 [0.779]
SOFT * LT_OF				0.244 [0.301]	0.126 [0.621]
Credit Rationed	-0.014 [0.823]	-0.027 [0.681]	-0.011 [0.864]	-0.012 [0.852]	-0.020 [0.762]
AUDIT	0.017 [0.651]	0.024 [0.529]	0.017 [0.655]	0.017 [0.645]	0.019 [0.610]
Log(bank)	-0.056 [0.134]	-0.054 [0.149]	-0.059 [0.115]	-0.053 [0.152]	-0.058 [0.117]
Rel. Length	-0.017 [0.523]	-0.024 [0.392]	-0.016 [0.561]	-0.018 [0.513]	-0.020 [0.462]

Firm Age	0.074*** [0.006]	0.075*** [0.005]	0.073*** [0.007]	0.073*** [0.007]	0.075*** [0.005]
PROFIT	0.005 [0.595]	0.006 [0.571]	0.005 [0.660]	0.006 [0.566]	0.005 [0.633]
FA/TA	0.276*** [0.002]	0.279*** [0.001]	0.268*** [0.002]	0.279*** [0.001]	0.267*** [0.002]
Firm Size	-0.014 [0.422]	-0.015 [0.372]	-0.012 [0.489]	-0.016 [0.352]	-0.013 [0.471]
LEVERAGE	-0.020*** [0.000]	-0.018*** [0.000]	-0.019*** [0.000]	-0.020*** [0.000]	-0.019*** [0.000]
CORPORATION	0.079 [0.369]	0.071 [0.415]	0.081 [0.358]	0.070 [0.418]	0.085 [0.335]
GROUPE	0.001 [0.980]	0.003 [0.942]	-0.001 [0.980]	0.003 [0.945]	0.005 [0.912]
CONSORTIUM	-0.050 [0.532]	-0.044 [0.586]	-0.057 [0.475]	-0.040 [0.628]	-0.050 [0.533]
NATIONAL BANK	0.030 [0.399]	0.028 [0.424]	0.031 [0.379]	0.028 [0.433]	0.032 [0.362]
GDP	1.949** [0.023]	1.901** [0.029]	1.972** [0.022]	1.941** [0.023]	1.978** [0.024]
HHI1	30.008** [0.012]	30.055** [0.011]	30.603*** [0.010]	29.154** [0.014]	31.661*** [0.007]
Loans/Deposit	0.928*** [0.001]	0.949*** [0.001]	0.953*** [0.001]	0.905*** [0.001]	0.988*** [0.001]
Civil Suits	185.965*** [0.000]	187.688*** [0.000]	189.176*** [0.000]	191.103*** [0.000]	187.107*** [0.000]
Province Indicators	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes
Constant	-25.562** [0.010]	-25.089** [0.012]	-25.895*** [0.009]	-25.354** [0.010]	-26.118*** [0.009]
Observations	965	965	965	965	965
R ²	0.149	0.146	0.148	0.145	0.153
Adjusted R ²	0.026	0.023	0.025	0.022	0.025

Table A8

Determinants of the Portion of Trade Credit in Total Short-Term Loan in Subsamples

These regressions show the impact of the use of soft information and of lending technologies on the quantity of trade in total short-term loan in subsamples based on the number of employees (Columns 1 and 2), age (Columns 3 and 4) and bank type (Columns 5 and 6). We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	By number of employees		By firm age		By bank type	
	≤ mean	> mean	≤ mean	> mean	National	Local
	(1)	(2)	(3)	(4)	(5)	(6)
	TC/STL	TC/STL	TC/STL	TC/STL	TC/STL	TC/STL
SOFT	0.040 [0.746]	-0.192* [0.054]	0.162 [0.305]	-0.229** [0.011]	-0.094 [0.387]	-0.146 [0.177]
LT_REL	0.119 [0.498]	-0.027 [0.856]	-0.048 [0.739]	0.019 [0.904]	-0.182 [0.314]	0.089 [0.578]
SOFT * LT_REL	0.252 [0.561]	-0.700** [0.012]	0.370 [0.404]	-0.771*** [0.003]	-0.214 [0.663]	-0.350 [0.341]
LT_TRANS	0.127 [0.450]	-0.037 [0.832]	0.234 [0.153]	-0.001 [0.996]	0.298 [0.163]	-0.120 [0.403]
SOFT * LT_TRANS	-0.297 [0.546]	1.161*** [0.000]	-0.521 [0.291]	1.300*** [0.000]	0.383 [0.458]	0.799** [0.039]
Credit Rationed	0.048 [0.576]	-0.019 [0.875]	0.007 [0.944]	0.041 [0.690]	0.279* [0.086]	-0.052 [0.501]
AUDIT	-0.009 [0.880]	0.055 [0.323]	0.032 [0.581]	0.014 [0.799]	-0.100 [0.304]	0.053 [0.221]
Log(Bank)	-0.058 [0.432]	-0.045 [0.332]	0.018 [0.777]	-0.062 [0.203]	-0.138* [0.074]	-0.011 [0.812]
Rel. Length	-0.035 [0.429]	-0.006 [0.875]	-0.012 [0.817]	-0.031 [0.388]	0.046 [0.338]	-0.037 [0.324]
Firm Age	0.085* [0.063]	0.083** [0.019]	0.066 [0.300]	0.100 [0.126]	0.045 [0.322]	0.086** [0.017]
PROFIT	-0.015 [0.495]	0.017 [0.188]	0.019 [0.216]	0.004 [0.769]	0.018 [0.141]	0.002 [0.914]
FA/TA	0.382***	0.038	0.387***	0.154	0.345**	0.238**

Firm Size	[0.004]	[0.773]	[0.006]	[0.193]	[0.036]	[0.035]
	-0.057	-0.022	-0.052*	0.000	-0.001	-0.022
	[0.245]	[0.450]	[0.053]	[0.990]	[0.983]	[0.407]
LEVERAGE	48.303	-0.024***	-103.273	-0.022***	-107.857	-0.015***
	[0.639]	[0.000]	[0.248]	[0.000]	[0.301]	[0.001]
CORPORATION	0.014	0.104	-0.115	0.263***	0.190	0.097
	[0.888]	[0.553]	[0.481]	[0.003]	[0.220]	[0.384]
GROUPE	0.035	-0.033	0.002	-0.010	-0.049	0.017
	[0.703]	[0.522]	[0.979]	[0.858]	[0.508]	[0.761]
CONSORTIUM	-0.031	-0.080	-0.073	0.068	-0.169	-0.022
	[0.770]	[0.580]	[0.551]	[0.550]	[0.400]	[0.829]
NATIONAL BANK	0.066	0.055	-0.004	0.059	-	-
	[0.234]	[0.323]	[0.939]	[0.232]		
GDP	2.622	10.090	0.345	2.351**	1.530	2.073
	[0.507]	[0.191]	[0.919]	[0.048]	[0.271]	[0.543]
HHI1	1.941	10.228***	-5.400*	49.422***	33.758	4.694
	[0.627]	[0.000]	[0.067]	[0.008]	[0.133]	[0.155]
Loans/Deposit	-0.497	-0.037	-0.415	1.448***	0.996*	-0.202
	[0.492]	[0.954]	[0.500]	[0.000]	[0.054]	[0.749]
Civil Suits	322.600	88.361	-35.239	204.347***	206.585***	141.516
	[0.551]	[0.461]	[0.938]	[0.000]	[0.000]	[0.761]
Province Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-26.344	-105.374	-2.073	-31.998**	-21.251	-22.138
	[0.513]	[0.174]	[0.953]	[0.026]	[0.209]	[0.524]
Observations	468	497	423	542	341	624
R ²	0.262	0.223	0.240	0.255	0.334	0.163
Adjusted R ²	0.043	0.012	0.007	0.067	0.069	-0.020

Table A9

Determinants of the DPO

These regressions show the impact of the use of soft information and of lending technologies, divided into four indicators, on duration of trade measured by the DPO. We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	(1)	(2)	(3)	(4)	(5)
	DPO	DPO	DPO	DPO	DPO
SOFT	-7.701 [0.640]	-6.684 [0.716]	4.245 [0.785]	-0.673 [0.966]	-3.528 [0.845]
LT_REL	4.140 [0.825]	13.441 [0.442]	-4.884 [0.747]	9.189 [0.606]	14.220 [0.461]
SOFT * LT_REL	-66.214 [0.319]	15.423 [0.735]	-21.981 [0.698]	-3.673 [0.944]	-69.837 [0.290]
LT_TRANS	-3.397 [0.863]				
SOFT * LT_TRANS	158.052** [0.026]				
LT_FS		-12.746 [0.339]			-16.653 [0.241]
SOFT * LT_FS		47.783 [0.239]			48.092 [0.244]
LT_RE			10.313 [0.433]		19.238 [0.192]
SOFT * LT_RE			90.810* [0.074]		71.414 [0.274]
LT_OF				-10.739 [0.554]	-16.384 [0.411]
SOFT * LT_OF				79.817 [0.110]	35.688 [0.572]
Credit Rationed	6.830 [0.594]	5.402 [0.677]	8.291 [0.514]	6.861 [0.594]	6.317 [0.623]
AUDIT	1.855 [0.811]	2.674 [0.731]	1.428 [0.853]	2.280 [0.769]	2.527 [0.744]
Log(bank)	-13.381* [0.068]	-13.086* [0.078]	-14.275** [0.050]	-12.786* [0.083]	-14.195** [0.050]
Rel. Length	2.248 [0.699]	1.377 [0.814]	2.930 [0.615]	2.157 [0.712]	2.158 [0.712]

Firm Age	11.917** [0.018]	11.928** [0.018]	11.531** [0.022]	11.906** [0.018]	12.004** [0.017]
PROFIT	0.581 [0.817]	0.636 [0.801]	0.387 [0.877]	0.595 [0.811]	0.321 [0.899]
FA/TA	64.337** [0.013]	64.779** [0.013]	62.247** [0.016]	65.386** [0.012]	62.223** [0.016]
Firm Size	0.890 [0.848]	0.583 [0.901]	1.355 [0.771]	0.568 [0.903]	1.438 [0.756]
LEVERAGE	-3.552*** [0.000]	-3.369*** [0.000]	-3.489*** [0.000]	-3.315*** [0.000]	-3.032*** [0.000]
CORPORATION	28.236* [0.078]	26.289 [0.113]	29.824* [0.059]	25.290 [0.125]	29.469* [0.063]
GROUPE	-13.558* [0.097]	-13.248 [0.105]	-14.219* [0.081]	-13.347 [0.103]	-13.510* [0.097]
CONSORTIUM	-5.675 [0.740]	-4.208 [0.811]	-8.004 [0.628]	-3.479 [0.845]	-7.111 [0.671]
NATIONAL BANK	12.818* [0.074]	12.373* [0.087]	13.188* [0.067]	12.534* [0.082]	13.690* [0.059]
GDP	358.261** [0.013]	350.021** [0.016]	367.944** [0.010]	349.389** [0.015]	362.462** [0.014]
HHI1	5786.920*** [0.005]	5729.059*** [0.005]	5942.525*** [0.004]	5568.484*** [0.007]	6125.585*** [0.003]
Loans/Deposit	191.789*** [0.000]	193.396*** [0.000]	196.498*** [0.000]	186.827*** [0.000]	204.680*** [0.000]
Civil Suits	3.3e+04*** [0.000]	3.3e+04*** [0.000]	3.3e+04*** [0.000]	3.4e+04*** [0.000]	3.3e+04*** [0.000]
Province Indicators	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes
Constant	-4.8e+03*** [0.005]	-4.7e+03*** [0.006]	-4.9e+03*** [0.004]	-4.6e+03*** [0.006]	-4.8e+03*** [0.005]
Observations	968	968	968	968	968
R ²	0.169	0.164	0.170	0.165	0.172
Adjusted R ²	0.049	0.043	0.050	0.045	0.048

Table A10

Determinants of DPO in Subsamples

These regressions show the impact of the use of soft information and of lending technologies on the duration of trade measured by the DPO in subsamples, based on the number of employees (Columns 1 and 2), age (Columns 3 and 4) and bank type (Columns 5 and 6). We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	By number of employees		By firm age		By bank type	
	≤ mean	> mean	≤ mean	> mean	National	Local
	(1)	(2)	(3)	(4)	(5)	(6)
	DPO	DPO	DPO	DPO	DPO	DPO
SOFT	-3.838	-17.120	56.991	-46.362***	-7.821	-8.510
	[0.891]	[0.449]	[0.173]	[0.005]	[0.725]	[0.725]
LT_REL	10.816	11.777	-27.585	10.548	-14.209	-9.786
	[0.722]	[0.672]	[0.299]	[0.700]	[0.645]	[0.722]
SOFT * LT_REL	95.709	-149.724***	124.257	-154.948***	-64.245	9.925
	[0.257]	[0.007]	[0.175]	[0.002]	[0.552]	[0.726]
LT_TRANS	33.655	-48.188	73.404**	-30.241	16.142	112.790
	[0.261]	[0.112]	[0.017]	[0.252]	[0.651]	[0.309]
SOFT * LT_TRANS	-2.712	273.849***	-169.051	372.113***	132.425	7.455
	[0.979]	[0.000]	[0.125]	[0.000]	[0.243]	[0.946]
Credit Rationed	18.989	1.574	7.891	6.467	31.954	-2.802
	[0.262]	[0.947]	[0.676]	[0.740]	[0.369]	[0.850]
AUDIT	5.244	5.458	-2.247	16.214	-1.071	3.750
	[0.633]	[0.658]	[0.844]	[0.165]	[0.960]	[0.667]
Log(Bank)	-6.792	-19.661*	-4.978	-14.270	-25.913*	-5.286
	[0.629]	[0.052]	[0.722]	[0.127]	[0.069]	[0.559]
Rel. Length	-7.819	11.144	-1.043	2.193	3.346	1.918
	[0.328]	[0.183]	[0.938]	[0.743]	[0.715]	[0.816]
Firm Age	17.084**	11.192	18.069	18.454	17.373*	8.614
	[0.029]	[0.137]	[0.165]	[0.115]	[0.061]	[0.190]
PROFIT	-0.129	0.852	-1.369	4.835**	4.276*	-1.527
	[0.974]	[0.810]	[0.797]	[0.036]	[0.068]	[0.742]
FA/TA	42.163*	70.207	104.919**	31.206	46.186	61.798*
	[0.084]	[0.123]	[0.033]	[0.228]	[0.202]	[0.067]
Firm Size	-12.387	2.356	1.641	-2.874	-4.160	3.619

LEVERAGE	[0.174]	[0.766]	[0.868]	[0.520]	[0.428]	[0.642]
	3.6e+04*	-3.665***	2.5e+04	-3.130***	7.4e+04*	-3.358***
CORPORATION	[0.084]	[0.001]	[0.375]	[0.000]	[0.051]	[0.000]
	12.259	50.696*	10.545	57.049***	15.372	45.890**
GROUPE	[0.523]	[0.096]	[0.724]	[0.002]	[0.601]	[0.011]
	-12.420	-20.706*	-17.644	-10.785	-15.473	-12.442
CONSORTIUM	[0.399]	[0.063]	[0.275]	[0.295]	[0.265]	[0.241]
	4.234	-1.687	-0.664	12.928	-11.321	-2.427
NATIONAL BANK	[0.854]	[0.960]	[0.982]	[0.526]	[0.824]	[0.907]
	27.073**	11.596	-2.456	28.269***	-	-
GDP	[0.010]	[0.362]	[0.838]	[0.003]		
	48.059	1571.269	-23.574	408.460*	153.181	257.226
HHI1	[0.943]	[0.266]	[0.971]	[0.051]	[0.461]	[0.664]
	13.717	2268.928***	-1.1e+03*	9052.273***	3859.310	649.865
Civil suits	[0.985]	[0.000]	[0.080]	[0.008]	[0.269]	[0.302]
	-77.438	38.928	-84.478	287.104***	110.864	-41.708
Province Indicators	[0.533]	[0.747]	[0.473]	[0.000]	[0.222]	[0.708]
	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-275.475	-1.7e+04	524.548	-5.8e+03**	-2.3e+03	-2.7e+03
	[0.968]	[0.243]	[0.937]	[0.024]	[0.374]	[0.656]
Observations	467	501	424	544	341	627
R ²	0.283	0.236	0.290	0.266	0.348	0.198
Adjusted R ²	0.070	0.030	0.073	0.082	0.087	0.023

Table A11

Determinants of Trade Credit – Main lending technology analysis

These regressions show the impact of the use of soft information and the main lending technologies used on the portion of Trade Credit. We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	(1)	(2)	(3)	(4)
	TC/TL	TC/TA	TC/STL	DPO
SOFT	-0.065 [0.149]	-0.055 [0.372]	-0.144 [0.140]	-6.709 [0.768]
MAINREL	-0.033 [0.372]	-0.040 [0.386]	-0.045 [0.594]	-13.672 [0.403]
SOFT * MAINREL	-0.258*** [0.000]	-0.269*** [0.000]	-0.622*** [0.000]	-119.040*** [0.000]
MAINTRANS	-0.000 [0.988]	-0.006 [0.770]	0.008 [0.829]	-2.838 [0.688]
SOFT * MAINTRANS	0.102* [0.059]	0.081 [0.268]	0.218* [0.067]	47.502* [0.097]
Control Variables	All	All	All	All
Province Indicators	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes
Constant	-11.825*** [0.008]	-13.845** [0.024]	-25.178** [0.011]	-4.7e+03*** [0.004]
Observations	971	971	965	968
R ²	0.148	0.134	0.141	0.155
Adjusted R ²	0.033	0.017	0.025	0.041

Table A11

Determinants of the Portion of Trade Credit in Total Loan, Total Assets and Total Short-Term Loan in Subsamples Based on Number Of Banks

These regressions show the impact of the use of soft information and of lending technologies on the quantity of trade credit on subsamples based on the number of banks the firm deals with. We control for bank–firm relationship and firm characteristic variables. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

	By number of banks							
	≤ 3 banks				> 3 banks			
	(1) TC/TL	(2) TC/TA	(3) TC/DST	(4) DPO	(5) TC/TL	(6) TC/TA	(7) TC/DST	(8) DPO
SOFT	-0.079 [0.235]	-0.122* [0.094]	-0.177 [0.218]	-28.994 [0.276]	-0.046 [0.268]	-0.050 [0.371]	-0.087 [0.360]	-5.427 [0.792]
LT_REL	0.069 [0.426]	0.083 [0.421]	0.114 [0.564]	16.185 [0.631]	0.019 [0.752]	-0.004 [0.959]	0.044 [0.749]	6.602 [0.791]
SOFT * LT_REL	-0.319 [0.165]	-0.309 [0.212]	-0.615 [0.196]	-76.674 [0.465]	-0.178 [0.347]	-0.102 [0.705]	-0.268 [0.542]	-73.771 [0.420]
LT_TRANS	-0.084 [0.276]	-0.088 [0.326]	-0.162 [0.340]	-14.531 [0.627]	0.006 [0.929]	0.027 [0.739]	0.079 [0.619]	-9.160 [0.745]
SOFT * LT_TRANS	0.542** [0.026]	0.581** [0.035]	1.288** [0.011]	246.077** [0.030]	0.310 [0.113]	0.215 [0.433]	0.410 [0.362]	145.721 [0.139]
Control Variables	All	All	All	All	All	All	All	All
Province Indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	2.279 [0.918]	5.872 [0.836]	16.993 [0.727]	3537.504 [0.683]	-11.360** [0.032]	-14.084* [0.059]	-25.325** [0.036]	-3.2e+03 [0.135]
Observations	354	354	351	353	617	617	614	615
R ²	0.331	0.347	0.320	0.420	0.202	0.190	0.203	0.204
Adjusted R ²	0.082	0.103	0.063	0.202	0.025	0.011	0.025	0.027

Table A13 - IV estimations

The table reports results for our instrumental variable regression. First part reports the first stage of our IV regression where our endogenous variables are LT_TRANS, LT_REL and SOFT. Second part reports the second stage of our IV regression. Variables with an * are our estimated endogenous variables. *Control* corresponds to all the exogenous variables used in normal regression. The regression is robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (as indicated in brackets).

First stage IV regress				
	(1)	(2)	(3)	
	LT_TRANS	LT_REL	SOFT	
<i>Instrumental variables</i>				
Provincial LT_TRANS	2.329 [0.197]	2.860 [0.225]		
L.O. Turnover	0.036*** [0.010]	-0.034** [0.011]		
Banks' M&A	-0.581** [0.036]	0.307 [0.407]		
Functional distance	-0.105 [0.394]	-0.001 [0.992]		
Length of Relationship			0.001* [0.077]	
Self-Confident			0.254*** [0.000]	
Control	All	All	All	
Observations	837	837	837	
R ²	0.659	0.668	0.219	
Adjusted R ²	0.606	0.616	0.098	
F instruments	64.22	63.05	16.02	
Second stage IV regress				
	(1)	(2)	(3)	(4)
	TC/TL	TC/TA	TC/STL	DPO
SOFT*	-0.104 [0.552]	-0.048 [0.833]	-0.351 [0.380]	-4.919 [0.946]
LT_REL*	0.131 [0.193]	0.124 [0.316]	0.460* [0.051]	44.871 [0.269]
SOFT* # LT_REL*	-0.976* [0.058]	-1.187* [0.079]	-2.768** [0.030]	-394.820* [0.066]
LT_TRANS*	0.014 [0.889]	0.001 [0.992]	-0.014 [0.951]	-18.537 [0.646]
SOFT* # LT_TRANS*	0.822* [0.092]	0.982 [0.120]	2.273* [0.059]	412.344* [0.054]
Control	All	All	All	All
Observations	837	837	831	835
R ²	0.164	0.148	0.169	0.185
Adjusted R ²	0.034	0.016	0.039	0.060