

Local Financial Development and Trade Credit (*)

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Local Financial Development and Trade Credit

Abstract

We investigate the relation between local financial development and trade credit in an integrated financial market. Our results suggest that trade credit complements formal finance at the local level. Provincial banking development in Italy increases the provision of trade credit by SMEs and stimulates the redistribution of loans via trade credit. However, cooperative banking reduces the use of trade credit at the local level. Evidence shows that lower levels of provincial banking development are linked with a stronger decline in trade credit at the start of the global financial crisis. We also find that SMEs in provinces with industrial districts use more trade credit.

Keywords: trade credit, local financial development, SME finance, cooperative banks, global financial crisis

JEL classification codes: G21, G32, P13, R12

1. Introduction

A growing literature finds that local financial development still matters in a globalized world with integrated financial markets. Local financial development is positively related to growth (Guiso et al., 2004b; Hasan et al., 2012; Kendall, 2012). It enhances the probability individuals starting their own businesses, favours entry of new firms and increases competition (Guiso et al., 2004b). Local banking development, which is the main dimension of local financial development, stimulates product innovation and R&D expenditures (Benfratello et al., 2008), reduces finance constraints (Alessandrini et al., 2009), and increases the use of debt (La Rocca et al., 2010). Furthermore, the structure of the local banking industry affects the provision of credit (Petersen and Rajan, 1995; Bonaccorsi di Patti and Gobbi, 2001; Shimizu, 2012). While these findings suggest that local financial development is important, no study has yet considered the role of trade credit in local financial development. This is surprising, since trade credit plays an important role in corporate finance, especially in countries where formal financial institutions are underdeveloped. Firms with better access to credit redistribute capital via trade credit to customers that are financially weaker, acting as agents for the financial institutions and channelling short-term funds from the financial institutions to their best use (e.g., McMillan and Woodruff, 1999; Demirgüç-Kunt and Maksimovic, 2001; Fisman and Love, 2003; Choi and Kim, 2005; Love et al., 2007; Carbó-Valverde et al., 2013; Garcia-Appendini and Montoriol-Garriga, 2013). Demirgüç-Kunt and Maksimovic (2001) find that the use of trade credit by firms within a country is positively related to the size of the national banking system, which suggests that the provision of trade credit complements a country's financial institution development.

In this study, we provide a unique contribution to the literature by investigating the relation between local banking development and the trade credit policies of small- and medium-sized enterprises (SMEs) in Italy. The focus on the local level in a single country allows us to

exploit within-country variation in financial development, thereby reducing the risk of omitted variable bias and implicitly controlling for differences in formal institutions. Following other studies on local financial development we study Italy, which provides an ideal setting (e.g., Bonaccorsi di Patti and Gobbi, 2001; Guiso et al., 2004b; Benfratello et al., 2008; Alessandrini et al., 2009; La Rocca et al., 2010). While Italy has been unified for the last 150 years, financial development across provinces and regions varies widely. Furthermore, trade credit is a very important source of finance for Italian firms. In the 2003-2009 period, accounts payable constituted on average 19.6% of total assets, while accounts receivable were 29.2% of their assets.¹ We study SMEs rather than large firms because trade credit is more likely to play an important role in SMEs' finance policies and these finance policies are more likely to be affected by local conditions.

Our focus is on local banking development, since the Italian financial system is a bank-based system in which stock markets play a very limited role. Our findings are consistent with the argument that trade credit reinforces the effect of local banking development on corporate finance. We find that firms located in provinces with a more developed banking system provide more trade credit to their customers. To a lesser extent, they also take more trade credit from their suppliers, resulting in higher net trade credit investments. Firms in provinces with a higher bank branch density also on-lend a larger part of their loans via trade credit to their customers. These results hold for different measures of local banking development, after controlling for firm-specific determinants of trade credit policy, and taking into account the North-South divide in Italy. Compared to Central Italy, SMEs located in Northern Italy have a significantly larger net trade credit to total assets ratio, while SMEs located in the South provide significantly less net trade credit to their customers.

¹ Source: Bank for the Accounts of Companies Harmonised (BACH), available at <http://www.bachesd.banque-france.fr>.

We also consider the degree of localism in the banking sector. The Italian banking system is characterized by an abundance of small, local banks which typically are cooperative banks and operate in restricted territorial areas (e.g., Alessandrini and Zazzaro, 1999; Alessandrini et al., 2009). Local cooperative banks may have competitive advantages over nationwide banks, as the latter are characterized by organizational complexity and may face more severe information problems due to the greater distance between their headquarters and local branches (Berger et al., 2005). Lending decisions of national banks will typically be based on hard information, while local cooperative banks make use of soft information collected directly and indirectly via personal relationships and continuous contact with local firms (e.g., Howorth and Moro, 2006). It has been argued that suppliers provide credit to their customers because the soft information generated in a repeated trading relationship gives them a significant advantage over banks in providing credit (e.g., Biais and Gollier, 1997; Petersen and Rajan, 1997). If both trade credit decisions and credit decisions of local cooperative banks are based on soft information, trade credit and cooperative bank loans could actually be a substitutes. Consistent with this view, we find that the existence of a high proportion of cooperative bank branches in a province is associated with a less positive relation between local banking development and trade credit. Furthermore, the on-lending of loans via trade credit by local suppliers is lower in provinces with a higher proportion of cooperative banks.

The financial crisis of 2008 may have significantly affected the trade credit policy of Italian SMEs. Some studies have found that more liquid firms and firms with better access to finance provide more trade credit during a crisis (Love et al., 2007; Garcia-Appendini and Monteriol-Garriga, 2013; Carbó-Valverde et al., 2013). Our results suggest that the use of trade credit by Italian firms significantly declined in 2008 and 2009, compared to previous years. Firms in provinces with a less developed banking system experienced a sharper decline in the use of trade credit in 2008, which indicates that firms could provide more trade credit at the start of

the crisis if they were located in a province with a more developed local banking sector. However, we do not find any significant effect of banking development on the use of trade credit in 2009. By 2009, the financial crisis may have eroded the advantage of being located in a province with a higher bank branch density.

Our findings are confirmed by a number of robustness tests. We consider the possibility that the observed relation between local banking development and trade credit may be caused by omitted variables. To accomplish this, measures of provincial banking development in 1936 are used as instruments for local banking development today (cf. Guiso et al., 2004). To further ascertain that our results are driven by differences between provinces, rather than by the North-Central-South divide in Italy (cf. Ferri and Messori, 2000), we re-estimate our regressions for Northern Italian firms only. Our results are also confirmed when we use other estimation techniques and when we take into account social capital, crime and the presence of industrial districts in provinces, which may also affect the trade credit policy of Italian SMEs.

The remainder of the study is structured as follows. In Section 2 we discuss how local banking development and cooperative banking may affect the trade credit policies of Italian SMEs. Section 3 discusses the data and variables used in this study. Section 4 reports the empirical findings and Section 5 concludes.

2. Trade credit, local banking development and cooperative banks

2.1. Local banking development

A number of studies have found that in institutional environments where access to formal finance is limited, firms with better access to credit redistribute capital via trade credit to customers that are financially weaker (e.g., McMillan and Woodruff, 1999; Demirgüç-Kunt and Maksimovic, 2001; Fisman and Love, 2003; Cull et al., 2009). Since local banking development in Italian provinces facilitates access to bank loans and reduce finance

constraints for firms in the province (Alessandrini et al., 2009; La Rocca et al., 2010), these findings lead us to expect that suppliers will provide more trade credit to their customers and therefore have more trade receivables on their balance sheet, if they are located in a province with a more developed banking sector. In other words, local financial development is positively related to trade receivables.

The effect of local banking development on trade payables is a priori not clear however. On the one hand, local banking development could have a positive supply effect on trade payables. To the extent that the suppliers of a firm are located in the same province as the firm, a more developed banking sector in the province will facilitate the provision of trade credit by the suppliers, and will therefore make it easier for firms to access trade financing. This argument suggests a *positive* relation between local banking development and trade payables. On the other hand, local banking development could have a negative demand effect on use of trade credit as a source of finance by local customers. In provinces with a developed banking sector, potential borrowers have better access to capital (Alessandrini et al., 2009) and therefore have less need for trade credit as a substitute source of financing (Demirgüç-Kunt and Maksimovic, 2001). Under these assumptions, a more developed local banking system will reduce the demand for trade payables. This argument therefore implies a *negative* relation between local banking development and trade payables.

Irrespective of whether the positive supply effect or the negative demand effect of local banking development on trade payables dominates, we expect that local banking development will increase trade receivables more than trade payables, thereby increasing net trade credit, i.e. the difference between the amount of trade credit provided to customers and the amount of trade credit taken from suppliers. We therefore predict a positive relation between local banking development and the net trade credit position of local firms.

2.2. Cooperative banks

The impact of local banking development may depend on the type of banks operating in a province. The Italian banking system has always been characterized by an abundance of small, local banks. Typically cooperative, these banks operate in restricted territorial areas. Only a limited number of large banks operate nationwide. This system is due to an institutional framework that, in the past, restricted the geographic mobility of banks and the structure of Italian industry (e.g., Alessandrini and Zazzaro, 1999; Alessandrini et al., 2009). Local cooperative banks may have competitive advantages over nationwide banks, as the latter are characterized by organizational complexity and may face more severe information problems due to the greater distance between their headquarters and local branches (Berger et al., 2005). A local bank operating in the local community, whose employees belong to the local community and who may be owned and/or managed by local community members, will have a more direct and in depth knowledge of local firms. The local bank takes part in the life of the local community, thereby acquiring information that is not available to banks that operate at a distance (e.g., Angelini et al., 1998). Lending decisions of national banks will typically be based on hard information (evaluation of financial statements, the provision of collateral and credit scoring), which is independent of the quality of the relation between the banker and the firm (e.g., Howorth and Moro, 2006). Local banks, on the other hand, make use of soft information collected directly and indirectly via personal relationships and continuous contact with local firms.² Even if national banks have local branches to supplement hard data on borrowers with relevant soft information collected locally, local banks are expected to have an informational advantage over national banks in the provision of loans to local firms, due to the proximity of local bank's headquarters (Bolton et al., 2013).

² For example, Howorth and Moro (2006) find that local entrepreneurs in Northern Italy choose local banks because their own suppliers are happy with the bank manager, and local banks obtain information about their clients from other customers.

The distance between bank headquarters and the local branch of a national bank is expected to negatively affect the transmission of information within banks, because bank headquarters are less able to interpret the information from distant branch loan managers than from closer ones.

It has been argued that suppliers provide credit to their customers because the soft information generated in a repeated trading relationship gives them a significant advantage over banks in providing credit (e.g., Biais and Gollier, 1997; Petersen and Rajan, 1997). Size and timing of the buyer's orders and his ability to take advantage of early payment discounts help the supplier in assessing the condition of the customer's business and his creditworthiness. If the credit decisions of local cooperative banks are based on soft information, their loans could actually be a substitute for trade credit. On the other hand, financing by national banks is less likely to be a substitute for trade credit since it relies more on hard information. We therefore expect that the existence of a high proportion of cooperative bank branches in a province reduces the need for trade credit, and is associated with a less positive relation between local banking development and trade credit.

2.3. The redistribution of bank loans

Cull et al. (2009) find that Chinese firms with better access to bank credit offer more trade credit to their customers per unit of bank credit. Since local banking development is expected to facilitate the provision of trade credit, we also investigate whether firms redistribute a larger part of the loans they receive by providing more trade credit to their customers and/or paying their suppliers faster when they are located in a province with a more developed banking system. If cooperative banks reduce the need for trade credit, we also expect that a higher proportion of cooperative bank branches in a province will reduce the effect of local banking development on the redistribution of loans via trade credit.

2.4. The effect of the global financial crisis

Finally, we consider the impact of the global financial crisis, which hit the Italian economy hard and led to a significant reduction in the supply of credit by financial institutions to Italian firms (Panetta and Signoretti, 2010; Presbitero et al., 2012). A number of authors (e.g., Petersen and Rajan, 1997; Cuñat, 2007) have argued that suppliers will support customers that experience temporary financial difficulties because suppliers have an interest in their customers' survival. If the customer fails, the supplier loses a valuable long-term relationship. A number of studies have found that trade credit may allow firms to absorb negative liquidity shocks during a financial crisis. Love et al. (2007) find that firms that were financially vulnerable to crisis sharply cut the amount of credit they extended to customers and increased their reliance on credit from suppliers during the 1997 Asian. In the recent financial crisis, more liquid firms and firms which were less dependent on external finance in the US provided more trade credit during the first phase of the crisis (Garcia-Appendini and Montoriol-Garriga (2013). Carbó-Valverde et al. (2013) find that while Spanish SMEs depend more on trade credit to fund their capital expenditures if they are more financially constrained, this effect became stronger during the recent financial crisis.

Italian SMEs located in provinces with a more developed banking system may have found it easier to provide trade credit during the global financial crisis. While the crisis is likely to have had a negative effect on trade credit, this effect may have been weaker in provinces with a higher branch density, provided that the availability of bank credit was higher in such provinces. However, it is unlikely such an effect persisted for very long, since the financial crisis led to a long-term contraction in bank credit. Indeed, Love et al. (2007) argue that while trade terms can be extended temporarily in the short run during a financial crisis, such terms cannot fully compensate for the long-term contraction in bank credit.

The crisis effect on trade credit might also have depended on the degree of cooperative banking in the local banking market. It has already been pointed out that cooperative banks

who provide loans based on soft information may reduce the need for trade credit. Presbitero et al. (2012) find that after the bankruptcy of Lehman Brothers, Italian manufacturing firms located in Italian provinces with a large share of branches owned by locally managed banks were less affected by credit constraints. Bolton et al. (2013) find that Italian firms relying on ‘relationship-banks’, i.e. banks with headquarters located in the same province as the firm’s headquarters, were better able to withstand the crisis than firms relying on ‘transaction-banks’. We therefore expect that a higher degree of cooperative banking in a province may have reduced the demand for trade credit by local firms during the crisis.

3. Data and variables

3.1. Data

Our dataset is derived from several sources. Data on financial and economic development and crime rates in the 103 Italian provinces are from the Italian National Institute of Statistics (ISTAT). Firm-specific data come from the Amadeus database of Bureau Van Dijk. This database contains the financial statements of privately held and publicly traded European firms, including more than one million Italian firms. We use the European Commission definition of small- and medium-sized enterprises to identify SMEs. This definition is based on three criteria. First, the number of employees must be less than 250. Second, the annual turnover may not exceed 50 million Euro or the annual balance sheet total may not exceed 43 million Euro. Third, firms must be independent. More specifically, firms may not have a shareholder with an equity stake of at least 25% (except for equity stakes of families, employees or directors) (European Commission, 2003). We also exclude micro enterprises from our sample, that is, firms that employ fewer than 10 persons and whose annual turnover or annual balance sheet total does not exceed two million Euro. For each firm, the selection is based on the last year with available data in the 2003-2009 period. After removing some

observations with missing data for the variables of interest, the unbalanced panel set includes 90,545 firm-year observations for 14,662 SMEs during the 2003-2009 period.

3.2. Local banking development

Our main measure of banking development in provinces is branch density, that is, the number of bank branches per thousand inhabitants in the province. This variable has been widely used as a measure of local banking development (e.g., Bonaccorsi and Gobbi, 2001; Degryse and Ongena, 2005; Benfratello et al., 2008; Alessandrini et al., 2009). The physical or operational proximity between the borrower and its lending office allows banks to supplement hard data on borrowers with relevant soft information collected locally. Soft information improves the quality of screening and monitoring borrowers, making these actions less costly and facilitating relationship lending (e.g., Petersen and Rajan, 1994). Furthermore, there is large dispersion in branch density across Italian provinces (Benfratello et al., 2008). Bonaccorsi and Gobbi (2001) find that provinces with a high number of bank branches relative to their population have greater bank credit. Alessandrini et al. (2009) present evidence that a higher branch density in Italian provinces reduces the financing constraints of firms, while Benfratello et al. (2008) find that branch density affects innovation and R&D expenses.

Additionally, we measure local banking development by *loans/GDP*, which is the ratio of loans provided by banks to GDP in the province. This measure also captures the credit allocation by banks in the province. We also consider *deposits/GDP*, which is the ratio of deposits collected by banks to GDP in the province, and measures the resources available to the financial sector in the province for lending. *Loans/deposits* is the ratio of loans provided by banks to deposits collected by banks in the province. It measures the extent to which banks

intermediate savings in a province into credit in the province. These variables are often used to measure the financial development of countries (e.g., Beck and Demirgüç-Kunt, 2009).³

Following Alessandrini et al. (2009) and Benfratello et al. (2008), we measure the degree of localism in the banking sector of a province by considering branches held by credit cooperative banks in the province. *Coop branch density* is the number of cooperative bank branches per 1,000 inhabitants in the province.

3.3 Firm characteristics

We consider three measures of trade credit policy. As a measure of the supply of trade credit by firms, *Receivables* is trade receivables over total assets. To measure trade credit demand, *Payables* is defined as trade payables over total assets. *Net trade credit* is *Receivables* minus *Payables* and reflects the net investment of firms in trade credit.

When considering the determinants of trade credit policy, we take into account firm characteristics that have been found in the trade credit literature to affect trade credit (e.g., Deloof and Jegers, 1996; Petersen and Rajan, 1997; Ge and Qiu, 2007; Giannetti et al., 2011). We include firm size and firm age as proxies for the creditworthiness of the firm (e.g., Petersen and Rajan, 1997). Larger and older firms, which have easier access to credit, will find it easier to extend trade credit to their customers. They will also find it easier to obtain trade credit from their suppliers. *Firm size* is measured by total assets (expressed in 1,000 €). *Firm age* is the number of years since the firm's incorporation. As a measure of profitability we also include *ebit/assets*, which is earnings before interest and taxes over total assets. Firms with more internal cash and higher profits will be able to extend more credit to their customers and therefore have more receivables on their balance sheet. The effect of profitability on trade payables is not clear a priori. It could be argued that more profitable

³ When we measure local banking development by deposits over population, loans over population or corporate loans over GDP, results are very similar to those reported in the paper.

firms will find it easier to obtain credit from their supplier, resulting in a positive relation between *ebit/assets* and payables. On the other hand, more internal cash reduces the need for trade credit, which may lead to a negative relation between *ebit/assets* and payables.

We also consider firm growth as a determinant of trade credit. A supplier may be more willing than a financial institution to provide credit to a growing firm that currently has low profits, if the supplier can capture future profitable business from the firm. This implies a positive relation between firm growth and payables. With respect to trade receivables, a firm may extend more trade credit to its customers in order to stimulate growth. We measure firm growth by *sales growth*, which is the year-over-year percentage growth rate in sales. Finally, we include *sales/assets*, which is sales over total assets, as a determinant of receivables and net trade credit, and *cogs/assets*, which is the cost of goods sold over total assets, as a determinant of payables. All regressions also include one-digit NACE industry dummies.

*** Table 1 about here ***

Table 1 presents descriptive statistics on local banking development in 103 Italian provinces (panel A) and firm characteristics for 90,545 firm-year observations over the 2003-2009 period (panel B). Descriptive statistics for local banking development are reported for 2009, which is the last year in our sample. While local banking development is measured on a yearly basis in our sample, it changes little over the sample period. Panel A of Table 1 shows that there is substantial variation in local banking development. For example, in 2009 the average number of bank branches per 1,000 inhabitants is 1.987 and ranges between 0.022 (Nuoro) and 5.695 (Rome). Panel B shows that trade credit plays a very important role in the financing of Italian SMEs; on average, one quarter of a firm's assets are financed with trade credit, while trade receivables constitute 31.9% of total assets. Net trade credit investments are 6.1% of total assets, on average.

Since prior studies on financial development in Italy have found significant differences between Northern, Central and Southern Italy (Angelini et al., 1998; Ferri and Messori, 2000; Alessandrini et al., 2009), we also include North and South dummies in all regressions to ensure that any effect of local banking development is not driven by the North-Central-South divide, but by differences in banking development at the provincial level. Following Guiso et al. (2004b), we set the dummy North equal to one for all observations in provinces north of Firenze, and the dummy South equal to one for all observations in provinces south of Rome.

*** Table 2 about here ***

Table 2 reports Pearson correlation coefficients between the trade credit variables and local banking development for the full sample of 90,545 observations. There is a significant positive correlation between local banking development and the use of trade credit, which provides a first indication that at the local level, trade credit is a complement rather than a substitute for formal finance. Not surprisingly, our measures of local banking development are also strongly correlated with one another.

*** Table 3 about here ***

4. Results

4.1. Local banking development and trade credit

First, we investigate the relation between trade credit and local banking development, measured by the density of bank branches in each province. Table 3 reports regression results based on ordinary least squares with standard errors clustered at the firm level. Since the local banking development measures (the variables of interest in our analysis) vary only at the provincial level, we additionally correct the standard errors for possible dependence of the

residuals within provincial clusters.⁴ At this stage we do not consider firm fixed effects because the level of local banking development changes very little over the period considered in this study. As a robustness check, however, we also estimate all regressions assuming random effects, and estimate regressions in which all variables are averaged over time. The results⁵ are very similar to the those reported in the paper.

The results of regressions 1, 2 and 3 support the argument that local bank development facilitates the provision of trade credit. Firms located in a province with a higher density of bank branches provide significantly more trade credit to their customers (regression 1), and have larger net investments in trade credit (regression 3). With respect to trade payables (regression 2), we find that firms finance a larger portion of their assets with trade credit if they are located in a province with a more developed banking sector, which is consistent with the argument that a more developed banking sector allows these firms to get more credit from their suppliers.

The North and South dummy coefficients suggest that compared to firms in Central Italy, Northern firms provide more trade credit to customers and take less trade credit from their suppliers, while Southern firms take more credit and provide less credit. The results for the other variables are generally in line with findings in the trade credit literature. Trade receivables and payables are positively related to sales and cost of goods sold, as well as to firm size. More profitable firms extend more credit to their customers but take less credit from suppliers. High growth firms use more trade credit in order to finance their new investments in current assets, resulting in a negative relation between trade payables and sales growth (Cuñat, 2007). Sales growth is negatively related to trade receivables, a finding that is consistent with the argument that firms with poor sales growth use trade credit as a

⁴We employ Mitchell Petersen's Stata-routine to cluster standard errors by two dimensions: http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm.

⁵ Available from the authors upon request.

mechanism to boost their sales by extending more credit to their customers. Finally, both trade receivables and payables are negatively related to age. This result, which has also been found in other studies on SMEs (e.g., Niskanen and Niskanen, 2006; Garcia-Teruel and Martinez-Solano, 2010), contradicts our expectation that firms that are more creditworthy firms will make greater use of trade credit. Younger firms (with weaker reputations) may need to use more trade credit in order to guarantee their products, but may need to rely more on trade financing because they have less access to formal finance.

In regressions 4, 5 and 6, we take into account the degree of localism in the province's bank system by including coop branch density. The coop branch density coefficients measure the extent to which the proportion of cooperative bank branches in the province affects the relation between branch density and trade credit. Interestingly, we find that a higher proportion of cooperative banks in the local banking system significantly reduces the positive effect that branch density generally exerts on trade credit. These results are consistent with the view that loans by cooperative banks are a substitute for trade credit because the credit decisions of both suppliers and cooperative banks are based on soft information.

*** Table 4 about here ***

Since we investigate the role of trade credit as a financing tool, we scale our trade credit variables by total assets rather than by sales or cost of goods sold. In order to confirm that the scaling choice does not affect our conclusions, in Table 4 we report results for *receivables on sales (days)*, which is $365 \times (\text{receivables}/\text{sales})$ (regression 7), *payables on COGS (days)*, which is $365 \times (\text{payables}/\text{cost of goods sold})$ (regression 8), and *receivables on sales (days) minus payables on COGS (days)* (regression 9). Control variables are the North and South dummies, firm age, firm size measured by sales instead of total assets, ebit over sales and sales growth. The results fully confirm those reported in Table 3. A change in branch density of two standard deviations increases the number days it takes firms to collect its sales by

approximately nine, while it increases the number of days it takes a firm to pay for its cost of goods sold by 4.5. A change of two standard deviations in cooperative branch density increases the number days it takes a firm to collect its sales by six, while it increases the number of days it takes a firm to pay for its cost of goods sold by 2.5.

*** Table 5 about here ***

In Table 5 we consider *loans/GDP* as an alternative measure of local banking development. For brevity, Table 5 reports only coefficients and significance levels for the provincial characteristics measures and for the North and South dummies. All regressions also include *ln(firm size)*, *ln(firm age)*, *ebit/assets*, *sales growth*, *sales/assets*, *cogs/assets*, year fixed effects and industry fixed effects as control variables. The results for the control variables (available from the authors upon request) are very similar to those reported in Table 3. The results for *loans/GDP* confirm our results for branch density. In regressions 10 and 11, we find that *loans/GDP* has a significant positive effect of on trade receivables and payables, resulting in a significant increase in net trade credit investments (regression 12). The effect of local banking development could be due to differences in the availability of deposits between provinces, but may also be affected by the extent to which banks intermediate savings into credit in the province. Indeed, it has been argued that savings have been drained out by the banks of the peripheral provinces in Italy, slowing down their development (Alessandrini and Zazzaro, 1999). In regressions 13, 14 and 15 we therefore distinguish between *deposits/GDP*, which is the ratio of deposits collected by banks to GDP in the province, and *loans/deposits*, which is the ratio of loans provided by banks to deposits collected by banks in the province. The results suggest that both the deposits available in the province and the extent to which these deposits are lent within the province matter; both variables significantly affect trade receivables (regression 13) and net trade credit (regression 15). On the other hand, while

deposits/GDP is significantly and positively related to trade payables, the loans/deposits ratio does not seem to affect trade payables (regression 14).

*** Table 6 about here ***

4.2. *Endogeneity of local banking development*

A potential problem with the findings is that the observed positive effect that local banking development and cooperative branch density have on trade credit may actually reflect omitted factors that affect both local banking development and trade credit, such as local economic development. To ascertain the effect that local banking development has on trade credit, we use exogenous determinants of the degree of banking development as instruments in two-stage least squares regressions. In line with Guiso et al. (2004), we use measures of the local supply of credit in 1936 as determinants of local banking development in the 2000s. While local banking structures in 1936 were largely determined by factors unrelated to local economic development, a new banking law in 1936 severely constrained the growth of the banking system. Since this law affected some types of banks more than others, and the type of banks in the system differed across regions, the law created significant local differences in banking development that may persist to present day. Consistent with this argument, Guiso et al. (2004) find that local banking development in 1936 is strongly correlated with local banking development in the 1990s, but it is only weakly correlated with contemporary local economic development⁶. First, we identify four measures of banking development in 1936 that significantly affect local banking development in 2003-2009: the number of bank branches and banks in the province, the total number of *banche popolari* in the province, and the number of bank branches over the population in the region in which a firm is located.⁷ For

⁶ Data on provincial banking development in 1936 were kindly provided to us by Luigi Guiso.

⁷ The 20 regions of Italy are the first-level administrative divisions of the state. Since data on provincial populations in 1936 are unavailable, this measure cannot be calculated at the provincial level. Likewise, measures based on GDP cannot be obtained because local GDP data in 1936 are available.

our sample, these variables alone explain 67% of the variation in branch density and 35% of the variation in coop branch density, which is in line with the results of Guiso et al. (2004). Regressions 16, 17 and 18 of Table 6 are based on two stage least squares estimation and fully confirm our previous findings: local banking development positively affects trade but cooperative banking has a negative effect. It should be noted, however, that the Hansen J-statistic is significant at the 5% level for regression 18 (net trade credit), indicating that the instruments in this regression are correlated with the error term.⁸

In the previous regressions we have taken differences between Northern, Central and Southern Italy into account by including North and South dummies in all our regressions. To further ascertain that our results are not driven by the North-Central-South divide, we re-estimate our basic regressions using data only from firms in Northern Italy. The results, which are reported in regressions 19, 20 and 21 of Table 6, again confirm the effect of local banking development on trade credit policy. The Hansen J-statistic indicates that the instruments are uncorrelated with the error term in all three regressions.⁹

4.3. Trade credit as a redistribution tool

Next, we investigate whether local banking development affect the redistribution of loans via trade credit. The redistribution view of trade credit holds that firms with better access to bank financing redistribute some of the loans they get from banks to less advantaged (but creditworthy) firms in the form of trade credit (Petersen and Rajan, 1997; Love et al., 2007). It can be expected that SMEs located in provinces with a more developed banking system have better access to bank credit, and therefore are more likely to redistribute bank loans by adjusting their trade credit policy. These SMEs could either provide more credit to their

⁸ The results in Table 5 are based on fewer observations than the previous results because there were fewer provinces in 1936 than there are today; observations for provinces that did not yet exist in 1936 are left out of the sample.

⁹ These results are confirmed if OLS is used instead of 2SLS-IV, and when local financial development is measured by loans/GDP (results available upon request).

customers and/or take less credit from their own suppliers, resulting in an increase in net trade credit. Conversely, we expect that in provinces where cooperative banking is more important, there is less need to redistribute bank loans via trade credit.

We test these hypotheses by including in the regressions *debt/assets* (debt over total assets), and the interactions between this variable and *branch density*,¹⁰ and *coop branch density* as determinants of trade credit policy. A positive coefficient is expected for the *debt/assets* × *branch density* interaction variable, while a negative coefficient is expected for the *debt/assets* × *coop branch density* interaction variable. Since the focus of this analysis is not local banking development per se, but the extent to which local banking development facilitates the redistribution of debt via trade credit, following Cull et al. (2009) we estimate fixed effects regressions that control for all time-invariant determinants of trade credit policy. Estimation results are reported in Table 7. P-values are based on heteroscedasticity robust standard errors clustered at the provincial level.

*** Table 7 about here ***

We first consider the effect of total debt in regressions 22, 23 and 24. The coefficient of *debt/assets* is significantly positive in regressions 22 and 24, suggesting that firms with more debt provide more (net) trade credit to their customers, ceteris paribus. To a lesser extent they also take more trade credit from their suppliers, resulting in a net increase in trade credit investments. The results for the interaction terms in regressions 22 (receivables) and 24 (net trade credit) confirm our expectations—firms in provinces with a higher branch density and a lower cooperative branch density on-lend a larger proportion of their debt via trade credit. The positive relation between *debt/assets* and *payables* in regression 23 suggests that debt and trade credit tend to be complements rather than substitutes for the firms in our sample. This is consistent with the theory of Burkart and Ellingsen (2004) that in an environment where

¹⁰ Very similar results are obtained when loans/GDP is used as a measure of local financial development.

creditors face a risk of diversion of cash by debtors, trade credit and bank credit will be complements because the availability of trade credit increases the amount that banks are willing to lend to constrained firms. However, the statistically insignificant coefficients of the $debt/assets \times branch\ density$ and $debt\ assets \times coop\ branch\ density$ interaction variables in regression 23 indicate that this effect does not depend on local banking development. When we distinguish between long-term debt (regressions 25 to 27) and short-term debt (regressions 28 to 30), it becomes clear that the observed effect of debt on the provision of trade credit is driven by short-term debt. Long-term debt had no significant effect on trade credit, indicating that firms use short-term debt rather than long-term debt to trade receivables, which is consistent with the argument that firms match the maturity of their assets and liabilities to reduce risk (e.g., Morris, 1976).

*** Table 8 about here ***

4.4. Impact of the global financial crisis

The global financial crisis hit the Italian economy hard and led to a significant reduction in the supply of credit by financial institutions to Italian firms (Panetta and Signoretti, 2010; Presbitero et al., 2012)). Italian SMEs located in provinces with a more developed banking system may have found it easier to provide trade credit during the global financial crisis, but it is unlikely such an effect persisted for very long, since the financial crisis led to a long-term contraction in bank credit. The effect of local banking development during the crisis is tested in Table 8. The results of regressions 31, 32 and 33 are again based on fixed effects estimation with robust standard errors taking into account clustering by provinces. *Branch density* and *coop branch density* are interacted with year dummies for 2007, 2008 and 2009. The results suggest that the use of trade credit by Italian SMEs significantly declined in 2008 and 2009, relative to the previous years. We do find that firms in provinces with a more developed banking system experienced a smaller decline in both the provision of trade credit (regression

31) and the use of trade credit (regression 32) in 2008. However, this effect seems to have disappeared by 2009. Consistent with the argument of Love et al. (2007), by 2009 the financial crisis may have eroded the advantage of being located in a province with a higher bank branch density. We also find a limited negative effect of coop branch density on receivables in 2008, but also this effect disappears in 2009.

4.5. Industrial districts, social capital and crime

Trade credit may be affected by other province characteristics which are correlated with local financial development. We therefore investigate how taking into account industrial district density, social capital and crime rates in provinces affects our results.

Industrial districts are an important feature of the industrial structure in Italy (e.g., Di Giacinto et al., 2012). Becattini (1992) defines industrial districts as social-territorial entities characterized by the active presence of both a community of people and a population of SMEs, in one naturally and historically bounded area. Industrial districts typically have numerous SMEs that specialize in a very limited number of phases in the production process of one industry and related industries. Repeated transactions between the same firms and individuals create interdependence and trust, and reduce asymmetric information. Dei Ottati argues that within industrial districts, firms with access to bank loans typically provide credit to their subcontractors who lack such access. These firms also have close relations with their banks, based on repeated personal relationship transactions. The combination of close relations with bank managers and subcontractors allows firms to on-lend the funds received as a bank loan to subcontractors on a basis of trust. Therefore, firms located in an industrial district are expected to provide more trade credit and make more use of trade credit than other firms. *Ceteris paribus*, trade credit will be more important for firms located in a province with a higher industrial district density. We measure *Industrial district density* by the number of manufacturing workers in industrial districts divided by the total number of manufacturing

workers at the province level, with industrial districts defined by ISTAT. The ISTAT definition of an industrial district is the outcome of a multi-step algorithm and is based on 1991 census data and is taken from De Arcangelis and Ferri (2005).

Local financial development is also related to local social capital (Guiso et al., 2004a) and local crime (Bonaccorsi di Patti, 2009). Financial contracts require trust, which is enhanced by social capital and is negatively affected by crime. However, trade credit also requires trust (Fisman and Love, 2003). An observed positive relation between banking development and the use of trade credit may therefore be affected by the degree of social capital and/or crime in a province. In line with Guiso et al. (2004a), we measure *social capital* by the average voter turnout at the province level for referenda in 2003, 2005, 2006 and 2009. Our crime rate measure concerns *extortion crimes* based on the average number of extortion crimes reported by police forces to the judicial authority per 100,000 inhabitants at the province level over the period considered. We focus on extortion crimes because such crimes are likely to affect trust in business relations.¹¹

*** Table 9 about here ***

The results in regressions 34, 35 and 36 in Table 9 confirm that industrial district density has a significant positive impact on both receivables and payables. However, the branch density and coop branch density coefficients remain significant after including the industrial density measure, confirming that they do not act as a proxy for industrial district density. While the coefficients of our social capital and extortion crimes measures included in Table 9 have the expected sign (positive for social capital in regressions 37-39, negative for extortion crimes in regressions 40-42), they are never significant. Our results therefore do not confirm that trade credit is significantly affected by provincial differences in trust or crime. Furthermore, the

¹¹ We find similar results if we use total crime rates.

number of bank branches and cooperative bank branches remain significantly related to trade credit after including our social capital and crime measures, confirming that the relation between local banking development and trade credit is not driven by provincial differences in social capital or crime.

5. Conclusion

In this study, we find that trade credit plays a significant role in local financial development by enforcing the positive effect of local bank development on the availability of finance to SMEs. SMEs located in Italian provinces with a more developed local banking system provide more trade credit to their customers. To a lesser extent, these SMEs also take more trade credit from their suppliers. Our results confirm that local differences in banking development and trade credit policy *within* countries matter, adding to earlier findings that the provision of trade credit is complementary to the development of financial institutions at the country level (Demirgüç-Kunt and Maksimovic, 2001). From a methodological point of view, focusing on the local rather than national level allows for within-country variation to be exploited, thereby reducing the risk of omitted variable bias and implicitly controlling for differences in formal institutions. This study also contributes to the literature on cooperative banking by demonstrating that local cooperative banking, which is based on soft information, reduces the use of trade credit by SMEs.

Our results also suggest that more debt leads to more trade credit if a firm is located in a province with a more developed banking system or a province with less cooperative banking. Finally, while firms in provinces with a more developed banking sector provided more trade credit at the start of the global financial crisis in 2008, we find that this effect had disappeared by 2009. This is consistent with the argument of Love et al. (2007) that trade terms cannot fully compensate for the long-term contraction in bank credit. Overall, our results suggest that even in a globalized world, local financial development still matters, and trade credit plays an

important role by allowing firms with better access to credit to redistribute capital via trade credit.

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Table 1: Descriptive statistics

Branch density is the number of bank branches per 1,000 inhabitants in the province; Coop branch density is the number of cooperative bank branches over population (1,000 inhabitants) in the province; loans/deposits is the ratio of loans provided by banks to deposits collected by banks in the province; deposits/GDP is the ratio of deposits collect by banks to GDP in the province; receivables is trade receivables over total assets; payables is trade payables over total assets; net trade credit is (trade receivables minus trade payables) over total assets; firm age is the number of years since the firm's incorporation; firm size is total assets (expressed in 1,000 €); ebit/assets is earnings before interest and taxes over total assets; sales growth is the year-over-year sales growth rate; sales/assets is sales over total assets: cogs/assets is the cost of goods sold over total assets.

Panel A: Local banking development (103 provinces, 2009)

| | Mean | Median | St. dev. | Min. | Max. |
|---------------------|-------|--------|----------|-------|-------|
| Branch density | 0.938 | 0.598 | 1.027 | 0.022 | 5.695 |
| Coop branch density | 0.110 | 0.049 | 0.153 | 0.000 | 0.762 |
| Loans/deposits | 1.450 | 1.446 | 0.532 | 0.196 | 3.864 |
| Deposits/GDP | 0.521 | 0.500 | 0.133 | 0.283 | 1.263 |

Panel B: Firm characteristics (90,545 firm-year observations, 2003-2009)

| | Mean | Median | St. dev. | Min. | Max. |
|------------------|-------|--------|----------|--------|---------|
| Receivables | 0.319 | 0.315 | 0.229 | 0 | 0.996 |
| Payables | 0.257 | 0.238 | 0.191 | 0 | 2.335 |
| Net trade credit | 0.061 | 0.047 | 0.211 | -2.081 | 0.991 |
| Firm age | 22 | 20 | 15 | 1 | 126 |
| Firm size | 8,198 | 5,253 | 10,840 | 3 | 644,047 |
| Ebit/assets | 0.059 | 0.047 | 0.067 | -0.126 | 0.329 |
| Sales growth | 0.097 | 0.044 | 0.361 | -0.999 | 2.438 |
| Sales/assets | 1.378 | 1.245 | 0.738 | 0.000 | 4.472 |
| Cogs/assets | 1.089 | 0.935 | 0.720 | 0.002 | 4.191 |

Table 2: Pearson correlations (90,545 firm-year observations, 2003-2009)

All variables are defined as before. Bold denotes significance at the 5% level.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-------------------------|--------------|---------------|--------------|--------------|--------------|--------------|--------------|-------|
| (1) Receivables | 1.000 | | | | | | | |
| (2) Payables | 0.507 | 1.000 | | | | | | |
| (3) Net trade credit | 0.625 | -0.356 | 1.000 | | | | | |
| (4) Branch density | 0.080 | 0.045 | 0.046 | 1.000 | | | | |
| (5) Coop branch density | 0.028 | 0.006 | 0.025 | 0.622 | 1.000 | | | |
| (6) Loans/GDP | 0.099 | 0.034 | 0.076 | 0.569 | 0.156 | 1.000 | | |
| (7) Loans/deposits | 0.091 | 0.031 | 0.070 | 0.292 | 0.255 | 0.744 | 1.000 | |
| (8) Deposits/GDP | 0.084 | 0.027 | 0.066 | 0.650 | 0.115 | 0.906 | 0.425 | 1.000 |

Table 3: Trade credit and local financial development

All variables are defined as before, except North, which is a dummy equal to one if the firm is located in Northern Italy, and South, which is a dummy equal to one if the firm is located in Southern Italy. Reported coefficients are estimated using ordinary least squares, with p-values in parentheses based on standard errors clustered by firms and provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

| Dependent variable: | (1) Receivables | (2) Payables | (3) Net trade credit | (4) Receivables | (5) Payables | (6) Net trade credit |
|---------------------|---------------------|----------------------|-------------------------|----------------------|----------------------|-------------------------|
| Branch density | 0.010*** (0.000) | 0.006*** (0.000) | 0.004** (0.049) | 0.015*** (0.000) | 0.008*** (0.000) | 0.007*** (0.000) |
| Coop branch density | | | | -0.075*** (0.000) | -0.031*** (0.001) | -0.043*** (0.001) |
| North | 0.003 (0.590) | -0.011** (0.041) | 0.016*** (0.005) | 0.008* (0.088) | -0.009* (0.058) | 0.018*** (0.001) |
| South | -0.014 (0.133) | 0.008 (0.213) | -0.023*** (0.005) | -0.017** (0.047) | 0.007 (0.300) | -0.025*** (0.001) |
| Ln(firm size) | 0.022*** (0.000) | 0.016*** (0.000) | -0.001 (0.529) | 0.022*** (0.000) | 0.016*** (0.000) | -0.001 (0.501) |
| Ln(firm age) | -0.005* (0.082) | -0.021*** (0.000) | 0.018*** (0.000) | -0.006* (0.051) | -0.022*** (0.000) | 0.018*** (0.000) |
| Ebit/assets | 0.160*** (0.000) | -0.213*** (0.000) | 0.493*** (0.000) | 0.159*** (0.000) | -0.213*** (0.000) | 0.493*** (0.000) |
| Sales growth | -0.006** (0.019) | 0.021*** (0.000) | -0.028*** (0.000) | -0.006** (0.015) | 0.021*** (0.000) | -0.028*** (0.000) |
| Sales/assets | 0.060*** (0.000) | | -0.045*** (0.000) | 0.059*** (0.000) | | -0.045*** (0.000) |
| Cogs/assets | | 0.109*** (0.000) | | | 0.109*** (0.000) | |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 |
| R-squared | 0.085 | 0.226 | 0.086 | 0.087 | 0.227 | 0.086 |

Table 4: Alternative measures of trade credit policy.

Receivables on sales (days) is $365 \times (\text{receivables}/\text{sales})$; Payables on COGS (days) is $365 \times (\text{payables}/\text{cost of goods sold})$; ebit/sales is earnings before interest and taxes over sales. All other variables are defined as before. Reported coefficients are estimated using ordinary least squares, with p-values in parentheses based on standard errors clustered by firms and provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively

| Dependent variable: | (7) Receivables on sales (days) | (8) Payables on COGS (days) | (9) Receivables on sales minus payables on COGS (Days) |
|---------------------|---------------------------------------|--------------------------------|--|
| Branch density | 4.355*** (0.000) | 2.213*** (0.007) | 2.141*** (0.000) |
| Coop branch density | -19.847*** (0.000) | -8.216** (0.026) | -11.631*** (0.000) |
| North | -4.414** (0.027) | -6.157** (0.025) | 1.743 (0.325) |
| South | 6.625** (0.027) | 15.592*** (0.000) | -8.966*** (0.000) |
| Ln(sales) | 2.398*** (0.001) | -1.064 (0.118) | 3.461*** (0.000) |
| Ln(firm age) | 4.474*** (0.000) | -1.027 (0.219) | 5.500*** (0.000) |
| Ebit/sales | 19.651** (0.010) | -37.926*** (0.000) | 57.577*** (0.000) |
| Sales growth | -7.630*** (0.000) | 2.847*** (0.003) | -10.477*** (0.000) |
| Industry FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |
| Observations | 90,545 | 90,545 | 90,545 |
| R-squared | 0.076 | 0.056 | 0.032 |

Table 5: Alternative measures of local financial development.

All regressions include firm characteristics ln(firm size), ln(firm age), ebit/assets, sales growth, sales/assets, cogs/assets, year fixed effects and industry fixed effects. All variables are defined as before, except loans/GDP which is the ratio of loans provided by banks to GDP in the province. Reported coefficients are estimated using ordinary least squares, with p-values in parentheses based on standard errors clustered by firms and provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

| Dependent variable: | (10) Receivables | (11) Payables | (12) Net trade credit | (13) Receivables | (14) Payables | (15) Net trade credit |
|----------------------|---------------------|---------------------|--------------------------|---------------------|---------------------|--------------------------|
| Loans/GDP | 0.023*** (0.000) | 0.010*** (0.000) | 0.013*** (0.000) | | | |
| Loans/deposits | | | | 0.010** (0.039) | -0.001 (0.809) | 0.010*** (0.001) |
| Deposits/GDP | | | | 0.066*** (0.000) | 0.038*** (0.000) | 0.029*** (0.000) |
| North | -0.002 (0.848) | -0.013 (0.137) | 0.013*** (0.003) | -0.001 (0.875) | -0.013* (0.081) | 0.013*** (0.002) |
| South | -0.013 (0.278) | 0.006 (0.513) | -0.020** (0.010) | -0.012 (0.324) | 0.004 (0.713) | -0.017** (0.033) |
| Firm characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 |
| R-squared | 0.086 | 0.225 | 0.087 | 0.086 | 0.226 | 0.087 |

Table 6: 2SLS instrumental variables.

Instruments include the number of bank branches in 1936, number of banks and number of *banche popolari* in the firm's province and the 1936 branch density in the firm's region. All regressions include firm characteristics ln(firm size), ln(firm age), ebit/assets, sales growth, sales/assets, cogs/assets, year fixed effects and industry fixed effects. All variables are defined as before. P-values in parentheses are based on robust standard errors clustered by provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

| Sample: | (16) | (17) | (18) | (19) | (20) | (21) |
|----------------------|----------------------|---------------------|---------------------------|-------------------------------|----------------------------|------------------------------------|
| Dependent variable: | Whole Receivables | Whole Payables | Whole Net trade credit | Northern Italy Receivables | Northern Italy Payables | Northern Italy Net trade credit |
| Branch density | 0.020*** (0.000) | 0.010*** (0.000) | 0.009*** (0.000) | 0.020*** (0.000) | 0.010*** (0.000) | 0.010*** (0.000) |
| Coop branch density | -0.123*** (0.001) | -0.045** (0.030) | -0.076*** (0.007) | -0.099*** (0.001) | -0.052*** (0.002) | -0.046* (0.054) |
| North | 0.012** (0.010) | -0.007 (0.107) | 0.021*** (0.000) | | | |
| South | -0.020** (0.031) | 0.008 (0.298) | -0.028*** (0.001) | | | |
| Firm characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Hansen J-statistic | 1.837 | 3.686 | 6.348** | 3.871 | 3.281 | 0.922 |
| Observations | 86,606 | 86,606 | 86,606 | 62,124 | 62,124 | 62,124 |
| R-squared | 0.087 | 0.228 | 0.086 | 0.102 | 0.235 | 0.063 |

Table 7: Trade credit as a redistribution tool

All regressions include firm fixed effects and firm characteristics ln(firm size), ln(firm age), ebit/assets, sales growth, sales/assets, cogs/assets. All variables are defined as before. P-values in parentheses based on robust standard errors clustered by provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

| Debt: Dependent variable: | (22) Total debt Receivables | (23) Total debt Payables | (24) Total debt Net trade credit | (25) LT-debt Receivables | (26) LT-debt Payables | (27) LT-debt Net trade credit | (28) ST-debt Receivables | (29) ST-debt Payables | (30) ST-debt Net trade credit |
|-----------------------------------|-----------------------------------|--------------------------------|--|--------------------------------|-----------------------------|-------------------------------------|--------------------------------|-----------------------------|-------------------------------------|
| Debt/assets × branch density | 0.022*** (0.003) | -0.002 (0.791) | 0.024*** (0.000) | -0.006 (0.294) | -0.008 (0.178) | 0.002 (0.691) | 0.034*** (0.001) | 0.001 (0.914) | 0.033*** (0.000) |
| Debt/assets × coop branch density | -0.176** (0.011) | -0.005 (0.924) | -0.172*** (0.002) | -0.096 (0.222) | -0.037 (0.631) | -0.059 (0.126) | -0.254*** (0.002) | -0.007 (0.910) | -0.247*** (0.002) |
| Debt/assets | 0.403*** (0.000) | 0.203*** (0.000) | 0.200*** (0.000) | 0.136*** (0.000) | 0.089*** (0.000) | 0.047*** (0.000) | 0.493*** (0.000) | 0.238*** (0.000) | 0.255*** (0.000) |
| Firm characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 |
| Number of firms | 14,662 | 14,662 | 14,662 | 14,662 | 14,662 | 14,662 | 14,662 | 14,662 | 14,662 |
| Within R-squared | 0.236 | 0.141 | 0.077 | 0.139 | 0.113 | 0.039 | 0.248 | 0.143 | 0.085 |

Table 8: Impact of the global financial crisis

Year 2009 and Year 2008 are year dummies. All regressions include firm fixed effects and firm characteristics $\ln(\text{firm size})$, $\ln(\text{firm age})$, ebit/assets , sales growth , sales/assets , cogs/assets . All variables are defined as before. P-values in parentheses are based on robust standard errors clustered by provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

| Dependent variable: | (31) Receivables | (32) Payables | (33) Net trade credit |
|---------------------------------|----------------------|----------------------|--------------------------|
| Year 2009 × branch density | 0.001 (0.215) | 0.002 (0.109) | -0.001 (0.448) |
| Year 2009 × coop branch density | 0.009 (0.479) | 0.006 (0.563) | 0.003 (0.777) |
| Year 2009 | -0.065*** (0.000) | -0.073*** (0.000) | 0.008*** (0.003) |
| Year 2008 × branch density | 0.003*** (0.000) | 0.003*** (0.001) | -0.000 (0.989) |
| Year 2008 × coop branch density | -0.014* (0.062) | -0.011 (0.183) | -0.002 (0.735) |
| Year 2008 | -0.043*** (0.000) | -0.053*** (0.000) | 0.010*** (0.001) |
| Year 2007 × branch density | 0.002* (0.094) | 0.002*** (0.001) | -0.000 (0.989) |
| Year 2007 × coop branch density | -0.010 (0.229) | -0.013** (0.048) | 0.002 (0.766) |
| Year 2007 | 0.005* (0.054) | 0.001 (0.611) | 0.004* (0.065) |
| Firm characteristics | Yes | Yes | Yes |
| Firm FE | Yes | Yes | Yes |
| Observations | 90,545 | 90,545 | 90,545 |
| Number of firms | 14,662 | 14,662 | 14,662 |
| Within R-squared | 0.085 | 0.070 | 0.034 |

Table 9: Other local characteristics

All regressions include firm characteristics $\ln(\text{firm size})$, $\ln(\text{firm age})$, ebit/assets , sales growth , sales/assets , cogs/assets , year fixed effects and industry fixed effects. All variables are defined as before, except industrial district density which is the number of manufacturing workers in industrial districts divided by the total number of manufacturing workers at the province level, with industrial districts defined by ISTAT and based 1991 census data (source: De Arcangelis and Ferri, 2005); social capital which is the average voter turnout at the province level for referenda in 2003, 2005, 2006 and 2009; extortion crimes which is the number of extortion crimes reported by police forces to the judicial authority per 100,000 inhabitants at the province level for each year. Reported coefficients are estimated using ordinary least squares, with p-values in parentheses based on standard errors clustered by firms and provinces. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

| | (34) Receivables | (35) Payables | (36) Net trade credit | (37) Receivables | (38) Payables | (39) Net trade credit | (40) Receivables | (41) Payables | (42) Net trade credit |
|-----------------------------|----------------------|----------------------|--------------------------|----------------------|----------------------|--------------------------|----------------------|----------------------|--------------------------|
| Industrial district density | 0.025*** (0.001) | 0.014*** (0.008) | 0.010 (0.102) | | | | | | |
| Social capital | | | | 0.040 (0.516) | -0.019 (0.568) | 0.051 (0.249) | | | |
| Extortion crimes | | | | | | | -0.001 (0.401) | -0.000 (0.518) | -0.000 (0.416) |
| Branch density | 0.019*** (0.000) | 0.010*** (0.000) | 0.008*** (0.000) | 0.015*** (0.000) | 0.009*** (0.000) | 0.006*** (0.000) | 0.016*** (0.000) | 0.009*** (0.000) | 0.007*** (0.000) |
| Coop branch density | -0.090*** (0.000) | -0.039*** (0.000) | -0.049*** (0.000) | -0.073*** (0.000) | -0.031*** (0.001) | -0.041*** (0.005) | -0.077*** (0.000) | -0.032*** (0.001) | -0.045*** (0.001) |
| North | 0.005 (0.351) | -0.011** (0.017) | 0.017*** (0.002) | 0.009* (0.065) | -0.009** (0.039) | 0.019*** (0.000) | 0.008 (0.109) | -0.009** (0.048) | 0.018*** (0.001) |
| South | -0.008 (0.392) | 0.012 (0.117) | -0.021*** (0.009) | -0.013 (0.257) | 0.005 (0.515) | -0.020** (0.034) | -0.013 (0.198) | 0.009 (0.219) | -0.022*** (0.008) |
| Firm characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 | 90,545 |
| R-squared | 0.088 | 0.227 | 0.087 | 0.087 | 0.227 | 0.087 | 0.087 | 0.227 | 0.086 |

