CFCM

CENTRE FOR FINANCE AND CREDIT MARKETS

Working Paper 11/04

No Going Back: The Interactions Between Processed Inventories and Trade Credit

Simona Mateut, Paul Mizen and Ydriss Ziane

Produced By:

Centre for Finance and Credit Markets
School of Economics
Sir Clive Granger Building
University Park
Nottingham
NG7 2RD

Tel: +44(0) 115 951 5619
Fax: +44(0) 115 951 4159
enquiries@cfcm.org.uk

CFCM

No Going Back: The Interactions Between Processed Inventories and Trade Credit

Simona Mateut, Paul Mizen, and Ydriss Ziane*

May 30, 2012

Abstract

Recent theories of trade credit argue that firms use it to manage inventories and more trade credit is used when the goods transacted are specialized. Here we argue that there is an important interaction between processed inventories and trade credit. Using a panel of over 500,000 observations for around 82,000 French firms across several sectors, we find evidence that as goods are fabricated they become more specialized, and larger inventories of these (semi) processed goods induce firms to offer more trade credit. We also find that as customers process goods the sellers' ability to salvage and resell those goods diminishes.

Keywords: trade credit, inventories

JEL classification: G31, G32

*Corresponding author: Simona Mateut: Nottingham University Business School, Jubilee Campus, Nottingham, NG8 1BB, UK; tel +44 115 846 8122; e-mail: simona.mateut@nottingham.ac.uk. Mizen: School of Economics, University of Nottingham, University Park, Nottingham, NG7 2RD, UK. e-mail: paul.mizen@nottingham.ac.uk. Ziane: Sorbonne Graduate Business School and GREGOR Research Centre, University Paris 1, France; e-mail: ziane.iae@univ-paris1.fr

1 Introduction

Trade credit provides short term finance accompanying the transfer of goods from supplier to buyer until payment is settled. The recent trade credit literature argues that firms offer trade credit to manage inventories and that more trade credit is used when the transacted goods are specialized. In this paper we explore the incentives that the stage of fabrication of inventories creates for the offer and receipt of trade credit. The key observation we make is that inventories are more dedicated to their owner once they are processed, altering the incentives for firms to offer and receive trade credit. First, there is a greater incentive for a firm to sell its goods - on trade credit if necessary - once inventories have been transformed: there is no going back to suppliers further upstream once goods have been processed to some degree. This increases the incentive for sellers of partly processed inventories to offer trade credit. Second, once goods are processed they have less value to the upstream seller if seized for non-payment, creating a disincentive for sellers to offer trade credit to downstream firms with large proportions of processed inventories. In other words, the advantages sellers have over banks in handling seized collateral diminish once goods are processed.

Our paper is connected to three strands in the trade credit literature. First, Burkart and Ellingsen (2004), Cuñat (2007), and Fabbri and Menichini (2010), demonstrate that specialized products tie customers and suppliers more closely together since there are fewer alternative uses for a specialized good (minimizing the incentives of a customer to divert the input) and fewer alternative suppliers. Second, Emery (1987), Bougheas et al. (2009), and Daripa and Nilsen (2011), propose that there are incentives for suppliers to subsidize the sale of goods to customers in order to minimize their own inventory holding costs. Third, Petersen and Rajan (1997), Longhofer and Santos (2003), and Frank and Maksimovic (2005) argue that suppliers may have advantages over banks in disposing of assets seized if the customer does not pay for them (collateral liquidation advantages), because goods that have not been paid for can be resold through their sales network.

We argue that the stage of fabrication of inventories held by the seller and the buyer plays an important role in motivating trade credit that has not been accounted for by the diversion, inventory management, or collateral liquidation theories. We augment the diversion theory, which is concerned about the nature of the transacted good, with the view that the good becomes more specialised as it is processed. Similarly, we supplement the inventory management theory, which considers the incentives to minimize inventory costs,

with the argument that goods in the pipeline create incentives to sell existing inventory, on trade credit if necessary. Finally, we propose that the advantages firms have over banks in collateral liquidation diminish as goods are processed. As Petersen and Rajan (1997, p. 664) have argued, 'The advantage of suppliers over financial institutions will vary cross-sectionally depending on the type of goods the supplier is selling and how much the customer transforms them.'

We make use of a unique dataset with information on the disaggregation of inventories at the level of the firm. Using a panel of around 82,000 French firms in several economic sectors, we explore the effects of the stage of fabrication of inventories on trade credit offered and received. We first confirm the empirical findings of Cuñat (2007) and Giannetti et al. (2011), and show that the inventory management theories of Bougheas et al. (2009) and Daripa and Nilsen (2011) are supported in the data. We then exploit the information on inventories at different stages of fabrication (raw materials, work in progress, semi-finished and finished goods, and goods for sale) to consider the effect on trade credit extended as inventories are processed from raw material form to work in progress, semi-finished and finished goods.

First, we find that the upstream inventory holding (relative to sales) has a negative effect on accounts receivable (relative to sales) and the impact is stronger in the case of processed inventories. As more work is done to the inputs, they are more dedicated to the owner; inventories of specialised goods have fewer diversion opportunities at every stage of production, therefore the seller has greater incentive to obtain sales, and trade credit provides the inducement to the customer to purchase inventory.

Second, we examine the impact of the stage of fabrication of inventories on the trade credit offered by different size classes of firms in sectors such as manufacturing, construction, and retailing. Our results suggest a greater sensitivity of trade credit extended to processed inventories compared to total inventories for smaller firms than for larger firms supporting trade credit theories by Bougheas et al. (2009) and Daripa and Nilsen (2011).

Third, we find that firms that purchase a higher proportion of differentiated inputs buy more on credit from their suppliers i.e. they have more trade credit received than other firms. Also, the higher the proportion of service inputs relative to standardized inputs, the lower the volume of trade credit taken. These are exactly the predictions of Fabbri and Menichini (2010), consistent also with the collateral liquidation motive proposed by Longhofer and Santos (2003), Frank and Maksimovic (2005), Cuñat (2007), and Giannetti et al. (2011). We determine that firms lose the advantage in collateral liquidation as the inventories are

processed by their customers from raw material form to work in progress, semi-finished and finished goods. The advantage we have over the original test employed by Petersen and Rajan (1997), which used average data for the firms in the same two-digit SIC category from Compustat, is that we have the proportion of goods at four stages of fabrication at the individual firm-level in our inventory data. Nevertheless, we confirm the original results reported by Petersen and Rajan. We also show that sectors that undertake little or no transformation of the product - wholesale and retail for example - receive more trade credit than other sectors, further confirming the argument we propose.

The following section presents briefly the background literature that motivates our empirical model for the extension of trade credit. Section 3 describes the data and summary statistics. In section 4, we present our empirical model and the methodology used. Section 5 presents our empirical work and in the final section we conclude.

2 Related Literature

There has been a long running debate about the motives suppliers and customers face in offering or receiving trade credit, many of which are summarized and then evaluated in Peterson and Rajan (1997).[1] We summarise below the three strands of this literature and dwell in more detail on the papers more closely related to ours.

2.1 Specialised goods and trade credit

Recent work by Burkart and Ellingsen (2004), Cuñat (2007), and Fabbri and Menichini (2010) stresses that the motives discussed by Petersen and Rajan are greatly influenced by the nature of the transacted good. Burkart and Ellingsen (2004) and Giannetti et al. (2011) note that the more standardized the product transacted the easier it is to divert its use to other purposes, and the easier it is to find alternative suppliers, so customer-seller relationships are weak and price discrimination through trade credit may be harder. As a product becomes more specialized in nature it has fewer alternative uses and fewer suppliers, which strengthens the relationship between customer and supplier that Petersen and Rajan

[1] A list of the most prominent theories includes information asymmetry (Smith, 1987), signalling (Biais and Gollier, 1997), price discrimination arguments (Brennan et al., 1988), financial monitoring advantages (Jain, 2000 and Mateut et al., 2006), product quality (Smith, 1997, Lee and Stove, 1993 and Long et al., 1993), redeployment of goods after default (Frank and Maksimovic, 2005 and Wilner, 2000), opportunistic behavior (Burkart and Ellingsen, 2004, Fabbri and Menichini, 2010) and inventory transactions costs (Ferris, 1981, Emery, 1987, Bougheas et al., 2009, Daripa and Nilsen, 2011).

(1997) found to be important. Burkart and Ellingsen (2004) point out that the advantage of trade credit lies in its illiquid nature, which is not easily diverted as cash inputs might be; this explains why trade credit is limited to the value of the inputs offered to the customer.

Cuñat (2007) argues that there is another reason for trade credit to increase when a firm uses a specialized product. Buyers and sellers enter symbiotic relationships in which neither has the incentive to damage the trust that exists between them. First, when goods are specialized, and sellers are difficult to replace, credit enforcement is easier for suppliers than for financial intermediaries. This is a formal statement of Petersen and Rajan's view. Second, suppliers offer credit when banks will not, and insure against liquidity shocks. They do this because trade credit is forward looking (based on future sales and business) while bank lending is backward looking (based on collateral accumulated).[2] This reinforces the customer-seller relationship further and encourages greater trade credit where goods are specialized. Finally, suppliers offer signals of reassurance to other creditors, e.g. banks, about the creditworthiness of their customers, and hence in equilibrium firms obtain bank and trade credit. In these circumstances, Cuñat (2007) predicts that trade credit volumes increase where the transacted good is specialized.

Both Cuñat (2007) and Giannetti et al. (2011) use firm-level data to examine the testable predictions of their theories. Cuñat uses the Fame dataset of the United Kingdom as do Mateut et al. (2006) and Bougheas et al. (2009). Giannetti et al. (2011) use the NSSBF data of the United States following Elliehausen and Wolken (1993) and Petersen and Rajan (1997); they also compare these results with those generated using Compustat data. Giannetti et al. (2011) establish that manufacturing firms that sell or buy differentiated goods use more trade credit than do those with standardized goods, or those from other industrial sectors. This is true for trade credit offered by sellers and trade credit received by buyers in separate tests. Cuñat (2007) explores how trade credit as a proportion of total assets (or total debt) varies with the length of the relationship built between customer and supplier (proxied by age). This is because his model allows a firm to specialize and build up a close relationship with its supplier, and for trade credit to increase as a result, due to the specialized nature of the transacted goods and services.

[2] In a similar vein, studying the 2007-2008 financial crisis, Garcia-Appendini and Motoriol-Garriga (2011) show that firms provide liquidity insurance to their clients when bank credit is scarce.

2.2 Inventories and trade credit

The literature by Ferris (1981), Emery (1987), Petersen and Rajan (1997), Longhofer and Santos (2003), Frank and Maksimovic (2005), Bougheas et al. (2009), and Daripa and Nilsen (2011) explores inventory transactions costs as a motive for offering trade credit. The underlying argument suggests that suppliers may offer trade credit as an incentive to buyers to hold higher stocks of inventories - shifting inventory holding from seller to buyer - but there are subtle differences between the theories proposed.

Bougheas et al. (2009) is based on a storage cost model, where the seller faces a stochastic demand. Firms have an incentive to extend trade credit to their customers in order to promote sales rather than accumulate costly inventories of finished goods, which they hold at a cost. This incentive is limited only by the need to obtain liquidity to meet their own obligations, producers might readily offer trade credit on appropriate terms to enhance sales and boost demand. The model is driven by the capacity a firm has to store finished goods, and this is disproportionately larger for bigger firms compared with smaller firms.

Daripa and Nilsen (2011) have a related but different model. It is the downstream buyer that faces the stochastic demand not the supplier. Two periods are necessary to produce the final product as each production process (supplier input and final product) takes one period. An unsatissfied final consumer may return after one period but does not return after two periods. In the face of demand uncertainty, the final good producer decides whether to hold inventory to meet sales or to order supplies when final demand for goods arrives. The decision is influenced by the cost of holding the inventory, which is not based on storage costs, but on inventory financing costs faced by the downstream firm, often through bank loans. If upstream suppliers have better credit terms they can counter this by offering a subsidy to their buyers in the form of trade credit, inducing the downstream firms to hold inventories.

2.3 Collateral liquidation and trade credit

The theory supported by Petersen and Rajan (1997), Longhofer and Santos (2003), and Frank and Maksimovic (2005) refers to the collateral liquidation motive. A producer firm has advantages in selling a repossessed good when a customer fails to pay for it compared to a bank that might seize the good as collateral in the face of non-payment of a loan. The firm has an established sales network and can redirect the good to its other customers, while

a bank has no such network. The lower transactions costs in repossession induce a seller to offer the goods on trade credit since they are easily redirected if the customer fails to pay for them. This comparative advantage will be more pronounced for differentiated goods because they are tailored to the needs of fewer customers, and it is harder to identify suitable buyers and to obtain reference prices (Fabbri and Menichini, 2010). This should contribute to shield suppliers of differentiated goods and services against buyer opportunism (Burkart and Ellingsen, 2004) in the same way as strong relationships with customers do. Therefore trade credit should be greater where suppliers can enforce payments more readily through the threat of termination of the specialized supply, and buyers have less incentive to renege on payments of trade credit where it is offered.

3 Data and summary statistics

3.1 Data Source

Our main data source is the profit and loss account and balance sheet data gathered by Bureau van Dijk in the Diane database, which provides a nationally representative sample of financial information about French companies, including trade credit taken and offered. The size of the dataset is considerably larger than other databases with a similar range of financial information used for the study of trade credit taken and offered. We include firms with more than three consecutive yearly observations and drop the 1 percent tails for each of the regression variables to control for the potential influence of outliers. The final sample includes information about over 82,000 French firms observed between 4 to 8 consecutive years. This gives us an unbalanced panel with about 583,429 firm-year observations on firms in different economic sectors over the time period 2000-2007. This dataset is larger than the 3,489 US firms in the Giannetti et al. (2011) study based on the 1998 NSSBF data, and larger than the 39,500 firms Cuñat (2007) uses from the Bureau van Dijk Fame database, covering manufacturing, retailers and wholesalers. We also have the advantage of more detailed information on the types of inventories held by firms which enables us to consider the inventory stage of fabrication motive. The majority of the firms included in the dataset are not traded on the stock market and this means we are likely to observe a large proportion of small and medium sized firms.

The database provides detailed industry-specific information that allows us to identify the characteristics of the traded products. The largest single sector in our database is

manufacturing, which comprises 24% of our total observations, and the remainder is made up of construction (21%), retail (16%), wholesale (12%), and services (28%), which includes tourism, financial services, real estate and others as recorded in Table 1. To test whether trade credit extension is correlated with product characteristics, we separate manufacturing firms producing differentiated goods from firms producing standardized goods as in Giannetti et al. (2011), following the classification of Rauch (1999). The data appendix gives the assignment of the UK 2003 SIC codes to differentiated and standardized goods categories. There are 89,603 observations for differentiated goods manufacturers and 52,190 observations for standardized goods manufacturers.

<Table 1 about here>

The Diane database also has vital information allowing us to separate work in progress and finished goods and services from the total stock of inventories. This gives us a further advantage in testing the inventory transactions cost model. We can separate inventories in total into four sub-categories of inventories in the French accounting system. These are: a) raw materials and consumables, which are the basic materials purchased from other firms to be used in the firm's production operations, b) work in progress, which are partially finished goods requiring (important) additional work before they become finished goods (more than 50% of the production process remains to be completed), c) semi-finished and finished goods, which require some minor additional work before they become goods for sale (less than 50% of the production process remains to be done), and d) goods for sale, which are goods on which the production has been totally completed but that are not yet sold. From these categories we construct total inventories from items a) - d), and processed inventories from items b) - d), which is the sum of work in progress, semi-finished and finished goods, and goods for sale. As more work is done to the inputs they are more dedicated to the owner and less easily re-sold when salvaged by the supplier, but in addition, inventories of differentiated goods manufacturers have fewer diversion opportunities than those of standardized manufacturers at every stage of production. This provides a more detailed test of the impact of differentiation of goods on trade credit than the test that separates firms into industries.

3.2 Sample Descriptive Statistics

Table 2 reports the summary statistics for our sample of firms separated into industrial sectors giving mean values and standard errors in brackets. We report in the first column all

manufacturing firms, and in columns 2 and 3 the manufacturers separated into differentiated goods producers and standardized goods producers. Columns 4 and 5 report results for construction and retail sectors.[3]

< Tables 2A and 2B about here >

From Table 2A, we notice first of all the striking difference in the ratio of trade credit extended to sales ($TCextended$) across sectors and across differentiated and standardized goods categories.[4] Manufacturing firms producing differentiated goods sell on credit about 50 per cent more sales than manufacturing firms producing standardized goods. Construction firms sell a similar amount of goods on credit as differentiated manufacturers, while retailers sell very little. By contrast, the uptake of trade credit ($TCtaken$) does not differ much across sectors, with firms in all sectors taking up a similar proportion of trade credit in sales. It is not unusual to observe similar trade credit received across sectors, since it depends on the characteristics of the inputs used, i.e. the proportion of differentiated versus standardized and service inputs. Firms producing differentiated goods extend three times more net trade credit than firms producing standardized goods, but they have very similar levels of net trade credit ($NetTC$) to the construction sector. The retail sector has positive net trade credit, indicating that unlike other sectors it receives much more trade credit than it offers - our conjecture about the role of processed inventories is able to explain this result because retailers do not process their inventories, and so they are offered more trade credit.[5] Given that the customers of the retail sector are mostly end consumers buying goods for cash or using credit cards that clear balances relatively quickly (Petersen and Rajan, 1997), this sector does not extend much trade credit.

We examine the bank loans and measures of inventory holdings in total and separated into the categories raw materials only and inventories excluding raw materials (all scaled by turnover) across sectors. The construction sector and the differentiated manufacturing sector has a lower ratio of bank loans to turnover. Inventories, raw materials and inventories

[3]The sample period is 1999-2007 for manufacturing and construction firms. Data for other service providers is available only from 2000 onwards. Therefore, results presented separately for retail firms and for the whole sample in Tables 1, 3, 7 and 8 refer to the period 2000-2007.

[4]In line with Petersen and Rajan (1997, p. 667-668) and Giannetti et al. (2011, p. 16-17), we fully recognise the simultaneous supply and demand issues in trade credit transactions in refering to accounts payable and accounts receivable as trade credit taken/received. To address this, we control for a large number of firm-specific characteristics and pick up systematic differences between sectors with industry dummies, or intercepts in separate regressions for each industry.

[5]The summary statistics provide mean values for trade credit received over sales. Retailers have higher sales than other sectors, and a similar ratio of trade credit received to sales. Therefore they have higher trade credit received than other sectors.

excluding raw materials show that the construction sector has lower inventories than other sectors, and manufacturers of all types have very similar levels of total inventories and raw materials. The retail sector has few raw materials, holding mostly finished goods, consistent with their activity as retailers of goods to end consumers.

The measures of scale such as real assets and real sales are reported in logarithms. Standardized goods manufacturers are larger on the basis of real assets and real sales compared to differentiated goods manufacturers. Retailers appear smaller still in terms of real assets, but their real sales are the largest in any sector. Construction firms have the smallest real assets and real sales. Retail firms have been established for a longer period than manufacturing firms and construction firms (on average), but standard deviations within the sub-samples are large suggesting that there are a mixture of older and younger firms in each sector.

Other characteristics of the firms reported are profitability, measured as profit over turnover, and liquidity, measured as current assets minus inventories and trade credit offered over turnover. The measure of risk takes ten values, representing deciles of the risk distribution, with higher values indicating a higher likelihood of corporate failure in the next 12 months.[6] We find that retailers and manufacturers of standardized goods have lower profitability than other sectors, and the retail sector has a lower liquidity ratio at 0.09 compared with other sectors in the range 0.123 - 0.130. Retail firms have a higher risk measure on average than firms in manufacturing or construction, but the mean values for manufacturers (differentiated and standardized) and construction firms are more similar. The probability of default implied by these average risk measures is between 10 and 20 percent for manufacturers and construction firms, and between 20 and 30 percent for retailers.

Breakdown of the data into different sizes by sector are reported in Table 2B. Firms are considered to be large if their mean real assets are in the top quarter of the distribution of average real assets for all firms operating in the same industry group. Large firms hold on average 50% higher inventories relative to sales than do small firms and this is even more relevant when we look at the ratio of work in progress and finished goods to sales, supporting the findings of Bougheas et al. (2009). The test of equality of p-values reported in the columns labeled 'diff' demonstrate clearly that, with a few exceptions, the mean values are significantly different in each comparison, and this confirms our findings in unreported tests of equality of means between different sectors where firm sizes are not distinguished.

[6] The details of the factors that contribute to the risk score and of the aggregation procedure are reported in the data appendix.

4 Empirical specification and estimation

We explore our empirical specification for trade credit extended from the suppliers perspective, by initially estimating the equation in the following variables:

$$\begin{aligned} TCextended_{it} &= \alpha_i + \beta_1 Inventories_{it} + \beta_2 X_{it} + \beta_3 Differentiated_i + \beta_4 Services_i + \\ &+ \beta_5 \mathrm{Re}\, tail_i + \beta_6 Wholesale_i + d_t + u_{it} \end{aligned} \tag{4.1}$$

where $TCextended_{it}$ is trade credit extended scaled by sales. The stock of inventories ($Inventories_{it}$) measure the incentives firms face to increase sales (and reduce inventories) by offering trade credit.We have two variants of our model: the first has a measure based on total inventories ($Total\_Inv_{it}$) and a second version where we use processed inventories ($Proces\_Inv_{it}$). The former measures all inventories including raw materials, while the latter excludes raw materials. We expect processed inventories to be more dedicated to the owner than raw materials, and to create a greater incentive to obtain sales, through trade credit if necessary.[7]

We control for firm-specific (α_i), time-invariant (d_t), and sector specific effects (*Differentiated*$_i$, *Services*$_i$, *Retail*$_i$, and *Wholesale*$_i$). The omitted category is *Standardized*$_i$. The sector specific effects allow us to test for the influence of the type of good on the trade credit extended. X_{it} is a vector of controls accounting for the supply side influences on trade credit extended, including the amount of bank loans ($BankLoans_{it}$), which controls for alternative sources of finance that might allow firms to offer trade credit while continuing production; the measure of the likelihood of company failure in the near future ($Risk_{it}$); *Profits*$_{it}$ given by the firm's profit (or loss) for the period; and $Liquidity_{it}$ defined as firm's gross liquid assets (cash, bank deposits, and other current assets excluding accounts receivable and stocks). With the exception of $Risk_{it}$,which is scale free, all variables are scaled by total sales. The logarithm of the firms' book value of assets controls for size effects ($Size_{it}$).

This model is estimated using the system generalized method of moments (SYS-GMM) where we control for the possible endogeneity of the regressors by using lags of each of the regressors as instruments. Time dummies are included in all our regressions and in the

[7] In a different context, Caggese (2007), Tsoukalas (2011), and Wen (2011) use the stage of fabrication of inventories to provide an analysis of input and output inventory dynamics in macroeconomic models. These papers refer to raw materials and work in progress as input inventories, and finished goods as output inventories. We define processed inventories as those that have been worked, either by the seller or the customer, and are therefore dedicated in some respects to the buyer. This is more consistent with the concept of differentiated goods used in the trade credit literature that we address.

instrument matrix. We report tests for serial correlation and the Hansen test for the legitimacy of variables dated t-2 and further as instruments in the differenced equation.[8] We also estimate the model using the Hausman-Taylor (HT) and the random effects (RE) estimator to provide evidence of the robustness of the results to different estimation methods.[9]

We then model the trade credit extended from the sellers' perspective in more detail. First, with the benefit of a much larger sample, we are able to estimate the trade credit extended equation separately for manufacturers with differentiated and standardized goods, and also for construction and retail sectors. We expect the use of trade credit to differ across industries because empirical studies have found wide variations across industries but rather similar credit terms within industries (Ng et al., 1999; Nilsen, 2002), and the reliance of firms on internal finance relative to external finance follows an industry pattern. We control for firm-specific (α_i), time-invariant (d_t), and industry-specific effects (v_{jt}).

$$TCextended_{it} = \alpha_i + \beta_1 Inventories_{it} + \beta_2 X_{it} + d_t + v_{jt} + u_{it} \tag{4.2}$$

Second, we are able to estimate separately the response of small and large firms in differentiated and standardized manufacturing firms, construction, and retail industries, where the size of the firm is determined relative to the industry. Firms are considered to be large if their mean real assets are in the top quarter of the distribution of the average real assets for all firms operating in the same industry. Firms are not allowed to transit between categories. It is important to control for differences in size because a firm's relationship with its bank can differ with its scale, and Daripa and Nilsen (2011) argue bank loans are used to finance inventories in the absence of a subsidy through trade credit. By controlling for size within industry this also allows for the effect of scale and industry on the cost of holding inventories, since inventory costs differ significantly across industries (Fazel, 1997; Shirley and Winston,

[8] The serial correlation tests are asymptotically distributed as a standard normal under the null of no serial correlation of the differenced residuals. Under the null of instrument validity, the Hansen test for overidentifying restrictions is asymptotically distributed as a chi-square with degrees of freedom equal to the number of instruments less the number of parameters. All GMM models are estimated using the xtabond2 estimator developed by Roodman (2009).

[9] We use the system and not the first difference GMM estimator as the latter cannot control for time invariant sector specific effects ($Differentiated_i$, $Services_i$, $Retail_i$ and $Wholesale_i$). Similarly, time invariant sector effects cannot be accomodated in a fixed effects (FE) estimation. Therefore, to check robustness of results to the choice of estimator we use the random effects (RE), which assumes that regressors are not correlated with the individual fixed effects, and the Hausman-Taylor (HT) estimator, which allows some regressors to be correlated with the individual fixed effects, but still does not allow for endogeneity of the regressors.

2004), and therefore the incentive firms face to generate sales by offering trade credit.[10]

Finally, we explain trade credit taken by estimating the following model:

$$\begin{aligned} TCtaken_{it} &= \alpha_i + \beta_1 Inventories_{it} + \beta_2 X_{it} + \beta_3 Pdiff_{it} + \beta_4 Pserv_{it} + \\ &\quad + \beta_5 \mathrm{Re}\, tail_i + \beta_6 Wholesale_i + d_t + u_{it} \end{aligned} \tag{4.3}$$

where the variables are similarly defined as in the previous model, but $TCtaken_{it}$ is the trade credit taken scaled by assets, $Pdiff_{it}$ is the proportion of differentiated goods inputs used by the firm, and $Pserv_{it}$ the proportion of service inputs used by the firm (defined as inputs from non-manufacturing industries over total inputs). Giannetti et al. (2011) argue that firms with a larger proportion of differentiated goods suppliers will take more trade credit than firms with more standardized goods suppliers, and similarly, those with more services will receive more trade credit. Once again, this model is estimated using the system generalized method of moments (SYS-GMM) which allows us to control for time-invariant sector-specific effects.[11] In a variant of this model we add the variable $PropProces\_Inv_{it}$ which measures the share of work in progress and finished goods in total inventories. Firms with a high proportion of goods that have been processed have relatively few goods to seize in raw material form, and the collateral liquidation advantages to the supplier will diminish.

5 Empirical results

5.1 Trade credit extended

Our first empirical result is reported in Table 3, where we present our findings from the full panel of data comprising 583,429 firm-year observations of 82,082 French firms in the period 2000 to 2007. We start our analysis with the determinants of the volume of trade credit from the sellers' perspective. Our variables in this model follow Giannetti et al. (2011) but we also control for the sellers' stocks of inventories. We report results estimated using system GMM, the Hausman-Taylor (HT), and the random effects (RE) estimator.

[10] All these models are estimated with first difference GMM. Industry specific time dummies are included in all specifications both as regressors and as instruments. Consistent with Bougheas et al. (2009) and Blundell et al. (1992), we identify four main industries within the standardized sector and five main industries within the differentiated sector. The data appendix describes the two-digit SIC codes included in each industry group. Results using other estimators are comparable, and are available from the authors on request.

[11] Again we run robustness checks on the estimation method using the Hausman-Taylor (HT) and the random effects (RE) estimator.

< Table 3 about here >

We test for the effect of the characteristics of the transacted goods on trade credit in Table 3. We find that firms classified as differentiated (manufacturing) goods producers have a positive and significant coefficient on an intercept dummy variable, which contrasts with a smaller positive and significant effect for service and wholesale firms, and a negative and significant effect for retailers. This can be interpreted as a demonstration of the lower moral hazard associated with differentiated goods, where there are fewer alternative suppliers if a buyer defaults on payment under the diversion theory; it is also consistent with the collateral liquidation hypothesis, since differentiated goods are more difficult to dispose of without a seller network (Fabbri and Menichini, 2010).

We exploit the unique information in the Diane dataset which allows us to distinguish among inventories according to their stage in the production process when we explore the relationship between inventories and trade credit. We expect trade credit extended to be influenced to a greater extent by goods that have been processed, that cannot be returned to their supplier. To test this we aggregate the stock of work in progress, semi-finished and finished goods, and goods for sale and scale it by sales for each firm ($Proces\_Inv$).

In column 1 of Table 3 we consider first the effect of all inventories, which we find has a negative and significant effect on trade credit extended as expected. This is consistent with Bougheas et al. (2009), where the cost of holding inventories incentivizes the firm to sell goods on trade credit. It is also consistent with Daripa and Nilsen (2011), according to whom the seller subsidizes the shift of inventories to the buyer. We then notice in column 2 that processed inventories have a stronger relationship with the volume of trade credit extended than total inventories. The coefficient estimate indicates a one percent decrease in inventories excluding raw materials is associated with a 0.76% increase in trade credit extended (consistent with higher sales volume) which is greater than the coefficient for total inventories. Our argument is similar to the sales motive identified by Wilson and Summers (2002), where firms extend sales by offering goods on account in the first instance, and the subsidy of inventory argument of Daripa and Nilsen (2011) but we make the link between the stage of fabrication of inventories that other authors have not previously assessed.

We introduce a number of controls for firm characteristics in our regressions for profits, liquidity of the firm, and bank loans, measured as ratios over total sales, and our risk measure that gives an indication of default risk on a discrete scale (1-10). Profits in our results has a negative and significant coefficient, meaning higher profits reduce trade credit extended

relative to sales. Trade credit provision is left to relatively unprofitable firms. Petersen and Rajan (1997) suggest that firms that are in trouble may use the extension of credit to attempt to maintain their sales. Less liquid firms in our sample extend more trade credit, which is similar to the finding of Petersen and Rajan (1997), who detect a negative relationship between firms' liquidity and their volume of sales on credit.

Our estimates for trade credit extended for each sector separately are presented in Table 4. We split the 19,445 manufacturing firms into differentiated and standardized goods manufacturers, and compare these firms with 14,326 construction firms and 12,207 retailers.

< Table 4 about here >

The most important result in this table is the relationship between trade credit extended and inventories in total and once they have been processed. The negative relationship between trade credit extended and inventories (in columns 1-4) is stronger in the differentiated manufacturing sector and the construction sector than for other sectors. The hypothesis that the diversion theory should more strongly apply to inventories of goods with fewer alternative uses or buyers is confirmed. Also, the coefficient on processed inventories (in columns 5-8) is larger in absolute value than the coefficient on total inventories (in columns 1-4) for all sectors. This offers support for our conjecture that partly processed or fully finished goods are more differentiated and less divertible than the raw material inputs, and for these types of goods the manufacturer has a stronger incentive to generate sales by offering trade credit. As far as we are aware there is no previous work that has tested this hypothesis.

The breakdown of the sample into these sectoral sub-samples, allowing for the type of goods, does not make major changes to the results for other controls reported in Table 3, however, firm size has greater influence on trade credit extended than before for manufacturers of differentiated goods, and construction firms. We also find that access to bank finance plays a more important role in the decision to extend trade credit for firms producing differentiated goods. Differentiated goods have a lower collateral value and therefore bank lending in the differentiated sector is lower than in the standardized goods sector. This result is in line with the summary statistics and supports the diversion value hypothesis in Giannetti et al. (2011). As firms in the differentiated sector are more constrained in their access to external funding, a unit increase in their bank loans leads to a marginally larger impact on their volume of trade credit extended relative to sales than in the case of firms in the standardized sector.

5.1.1 Supplier size

Given that the results in Table 4 seemed to show size matters for firms in different sectors, we now estimate the trade credit extended equation for small and large firms in different industries, using the 75 percentile of the real asset distribution as the cutoff point. Using a cutoff of 66 percent instead produces similar results. The separation into small and large firms relative to the industry allows for the fact that there are substantial differences in access to finance (Ng et al., 1999; Nilsen, 2002) and inventory costs (Fazel, 1997; Shirley and Winston, 2004) across industries. In particular, by splitting firms into size categories we are able to test whether smaller firms with higher inventory holding costs, following Bougheas et al. (2009), and therefore with more incentive to persuade customers to hold inventories, as explained in Daripa and Nilsen (2011), offer more trade credit than firms that are larger. We further suggest that once goods have been processed they are more dedicated to the firm and therefore the firms that already have incentives to induce sales with trade credit should face greater incentives if a greater proportion of their inventories are processed.

< Tables 5A and 5B about here >

Tables 5A and 5B consider size categories within each industrial sector and make allowance for differentiated and standardized goods manufacturers separately. The trade credit extension of small firms displays a greater sensitivity to total inventories in Table 5A and to processed inventories in Table 5B. This confirms that smaller firms have a stronger inventory transactions cost motive for offering trade credit compared to larger firms for all industries not just manufacturing, consistent with Bougheas et al. (2009).

We find that there is greater sensitivity to bank loans for smaller firms in differentiated and standardized manufacturing, construction and retail sectors compared to sensitivity to bank loans for larger firms. Berger et al. (2005) document that differences in firm size (and accounting records) affect the nature of the bank-firm relationship and the availability of bank credit. Therefore small firms are typically more likely to be credit constrained than larger firms. In line with Bougheas et al. (2009) and Petersen and Rajan (1997), we find that firms with better access to credit offer more trade credit. This could mean, at the margin, that access to bank loans would allow financially constrained smaller firms to offer trade credit and continue to finance production, while larger firms would be less likely to face a constraint.

In all our specifications, we include industry specific time dummies to control for in-

dustry characteristics, and the resulting models satisfy the conditions required in GMM of non-rejection of the hypothesis 'no serial correlation in the errors' and non-rejection of the Hansen test with only a few exceptions. In unreported specifications, we replace the industry dummies with an industry concentration index as in Giannetti et al. (2011), but the industry concentration variable does not perform well, although all our results remain intact. We also control for the age of the firm, which does not change our results, and similar to Giannetti et al. (2011), we find that firm age does not have a consistent impact on trade credit extension.

The empirical results reported in Tables 3 through 5 confirm the new prediction in our paper that processed inventories have a larger impact on trade credit than total inventories. Once work is done to the inputs they are more dedicated to the owner, and cannot be returned to the seller: there is no going back, which creates stronger incentives for sellers to offer trade credit.

5.2 Trade credit taken

We turn now attention to trade credit taken by firms. In order to link trade credit taken with the characteristics of the traded products we need to identify the nature of the various inputs the firms purchase. We construct the variables $Pdiff_{it}$ (the proportion of differentiated goods inputs used by the firm) and $Pserv_{it}$ (the proportion of service inputs from non-manufacturing industries over total inputs) to consider the effect of the type of goods used on trade credit taken. The information is derived from the input-output tables from INSEAD. As these variables do not vary much (if at all) over time and we want to include also dummies for firms in retail and wholesale, we use again the SYS-GMM estimator.

< Table 6 about here>

The results in Table 6 are reported for all 81,287 firms that are split into 61,160 small firms and 20,127 large firms using a 75% cutoff in the real asset distribution. The results confirm that firms that purchase a higher proportion of differentiated inputs buy more on credit from their suppliers. On the contrary, a higher proportion of service inputs relative to standardized inputs lowers the volume of trade credit taken. These results are consistent with the lower moral hazard associated with differentiated goods, as mentioned in the previous section, where there are fewer alternative suppliers if a buyer defaults on payment, and support the findings of Giannetti et al. (2011) and Daripa and Nilsen (2011). Our results are also consistent with the collateral liquidation hypothesis due to Longhofer and Santos (2003), Frank and Maksimovic (2005), Cuñat (2007) and Fabbri and Menichini (2010), as

differentiated products are worth more in the hands of their suppliers. This advantage is absent in the case of service suppliers as services have no liquidation value.[12]

<Table 7 about here>

In Table 7 we investigate the advantages of collateral liquidation. Petersen and Rajan (1997) argue that as inventories become more specialized they are more difficult to dispose of, making it less likely that a seller will have a strong advantage over any other creditor in the disposal of repossessed goods. They are able to approximate this effect using a measure of liquidation costs, defined as the share of finished goods in the total inventory averaged across firms in the same two-digit SIC category. Here we have much greater detail on the nature of inventory, and we record this for each firm in our dataset. Therefore we construct a similar liquidation cost variable based on the share of work in progress plus finished goods to total inventories for each firm and re-evaluate the results reported in Table 6. We expect to find that the larger the ratio the greater the liquidation costs for the supplier if they should repossess the goods offered on trade credit, and indeed as liquidation costs increase (due to the larger proportion of processed inventories in the form of work in progress, semi-finished and finished goods) so the trade credit taken falls in our results. This confirms the finding of Petersen and Rajan in our data, since there is a consistent and significantly negative coefficient irrespective of the estimation method used, but it also tells us that the impact of these liquidation costs are larger for bigger firms. A weakened collateral liquidation motive reduces the incentives to the seller to offer trade credit, and it works in the opposite direction to the diversion hypothesis.

In both Tables 6 and 7 we find that retail and wholesale firms take more trade credit than other sectors as indicated by the positive and significant coefficient on the dummy

[12]The legal system could prevent the supplier from seizing particular goods, and therefore, limit the liquidation motive for trade credit. For example, the U.S. laws allow suppliers to repossess the good only within 10 days from delivery, unless they establish a lien, which is a costly and infrequent practice. However, the EU Directive 2011 (replacing EU Directive 2000/35/EC), which regulates all commercial transactions in France and aims to improve the functioning of the EU internal market, recommends that "Member States shall provide in conformity with the applicable national provisions designated by private international law that the seller retains title to goods until they are fully paid for if a retention of title clause has been expressly agreed between the buyer and the seller before the delivery of the goods." There is no time limitation on repossession. In the extreme case that the buyer cannot meet its financial obligations, it may file for bankruptcy. The pro-debtor French bankruptcy law was explicitly intended to save bankrupt firms in order to protect employment and reduce domino effects on suppliers or trade creditors, who are often junior or unsecured claimants and face financial distress following the bankruptcy of their clients. But the reform implemented in 2006 aimed to render bankruptcy more creditor friendly, and the 2009 law stipulates that the ownership of property may be held as collateral by the effect of a retention of title clause which suspends the effect of a conveyance contract until full payment of the obligation which is its counterpart. This makes French law more supportive of creditors in bankruptcy than it once was.

variable indicating the firm belongs to one of these sectors. This provides confirmation of our conjecture that processed inventories diminish the advantages from collateral liquidation, because goods sold by upstream firms (mainly manufacturers) to retailers and wholesalers are not processed, they are stored and sold to their end consumers. Hence, the suppliers retain their comparative advantage in repossessing their goods if retailers/wholesalers do not pay on time. According to our hypothesis this explains why suppliers have a stronger incentive to extend trade credit to wholesalers and retailers than to other firms which transform the goods. Previous theories discussed above do not offer a reason for this finding in their results.

6 Conclusions

This paper proposes that the processing of inventories alters the incentives for firms to offer and receive trade credit. Once a product has been processed we argue it is more dedicated to the owner, creating a greater incentive for the goods to be sold - on trade credit if necessary. There is no going back to suppliers further upstream. The same argument makes it less attractive for suppliers to offer trade credit to firms since collateral cannot be liquidated so easily. We explore this proposition in the context of the recent trade credit literature, which discusses the motives for offering trade credit based on the nature of the good and the inventory management motive.

Using a panel dataset of about 82,000 French firms in several economic sectors, we are able to show that as more work is done to the inputs they are more dedicated to the owner; inventories of differentiated goods manufacturers have fewer diversion opportunities than those of standardized manufacturers at every stage of production, and that the seller does have greater incentive to obtain sales by using trade credit as an inducement to the customer to purchase the goods. We also find that trade credit extended shows greater sensitivity to processed inventories compared to total inventories, and that this effect is more powerful for smaller firms compared to larger firms in a range of different industries. Finally, when examining trade credit received we find that firms that have a higher proportion of processed inventories receive less trade credit, since the seller loses the collateral liquidation advantages as goods are processed. Wholesale and retail sectors, which undertake little or no transformation of the product, receive more trade credit than other sectors that process their inputs, further confirming the argument we propose.

Acknowledgments:

We thank Stefano Bonini, Spiros Bougheas, Steve Fazzari, Mariassunta Giannetti, Sourafel Girma, Alessandra Guariglia, Bruce Petersen, Piercarlo Zanchettin, participants at EARIE 2010, AFFI 2010, Money, Macro and Finance 2011 conference, seminars at the University of Nottingham, and the Sorbonne Graduate Business School. All remaining errors are our own.

References

Berger, A. N., Miller, N. H., Petersen, M., Rajan, R. G., Stein, J. C. 2005. Does function follow organizational form? Evidence from the lending practices of large and small banks. Journal of Financial Economics 76, 237-269.

Biais, B., Gollier, C., 1997. Trade credit and credit rationing. Review of Financial Studies 10, 903-937.

Blundell, R., Bond, S., Devereux, M., Schiantarelli, F., 1992. Investment and Tobin's Q: Evidence from company panel data. Journal of Econometrics 31, 233-257.

Bougheas S., Mateut, S., Mizen, P., 2009. Corporate trade credit and inventories: New evidence of a tradeoff from accounts payable and receivable. Journal of Banking and Finance 33, 300-307.

Brennan, M., Maksimovic, V., Zechner, J., 1988. Vendor financing. Journal of Finance 43, 1127-1141

Brown, J.R., Fazzari, S.M., Petersen, B.C., 2009. Financing innovation and growth: Cash flow, external equity and the 1990s R&D boom. Journal of Finance 33, 971-984

Brown, W., Haegler, U. 2004. Financial constraints and inventories. European Economic Review, 48, 1091 – 1123.

Burkart, M., Ellingsen, T., 2004. In-kind finance: A theory of trade credit. American Economic Review 94, 569-590.

Caggese, A. 2007. Financing constraints, irreversibility and investment dynamics. Journal of Monetary Economics 54, 2102-2130.

Cuñat, V., 2007. Trade credit: suppliers as debt collectors and insurance providers. Review of Financial Studies 20, 491-527.

Daripa, A., Nilsen, J., 2011. Ensuring sales: A theory of inter-firm credit. American Economic Journal: Microeconomics 3, 245-279.

Demirguc-Kunt, A., Maksimovic, V., 2002. Firms as financial intermediaries: Evidence from trade credit data. Working Paper, University of Maryland.

Elliehausen, G. E., Wolken, J. D., 1993. The demand for trade credit: An investigation of motives for trade credit use by small businesses. Working Paper, Board of Governors of the Federal Reserve System.

Emery, G., 1987. An optimal financial response to variable demand. Journal of Financial and Quantitative Analysis 22, 209-25.

Fabbri, D., Menichini, A.C., 2010. Trade credit, collateral liquidation, and borrowing constraints. Journal of Financial Economics 96 (3), 413-432.

Fazel, F., 1997. A comparative ananlysis of inventory costs of JIT and EOQ purchasing. International Journal of Physical Distribution & Logistics Management 27, 496-504.

Ferris, J. S., 1981. A transactions theory of trade credit use, The Quarterly Journal of Economics 96(2), 243-270.

Frank, M., Maksimovic, V., 2005. Trade credit, collateral, and adverse selection. Working Paper, University of Maryland.

Garcia-Appendini, E., Montoriol-Garriga, J., 2011. Firms as liquidity providers: Evidence from the 2007-2008 financial crisis. Unpublished working paper

Ge, Y., Qiu, J., 2007. Financial development, bank discrimination and trade credit. Journal of Banking and Finance 31, 513-530.

Gertler, M., Gilchrist, S.G., 1994. Monetary policy, business cycles, and the behavior of small manufacturing firms. Quarterly Journal of Economics 109, 309-40.

Giannetti, M., Burkart, M., Ellingsen, T., 2011. What you sell is what you lend? Explaining trade credit contracts. Review of Financial Studies 24, 1261-1298.

Jain, N., 2001. Monitoring costs and trade credit. Quarterly Review of Economics and Finance 41, 89-110.

Lee, Y., Stove, J., 1993. Product risk, asymmetric information, and trade credit. Journal of Financial and Quantitative Analysis 28, 285-300.

Long, M., Malitz, I., Ravid, A., 1993. Trade credit, quality guarantees and product marketability. Financial Management 22, 117-127.

Longhofer, J.A.C., Santos, S.D., 2003. The paradox of priority. Financial Management 32, 69-81.

Mateut, S., Bougheas, S., Mizen, P., 2006. Trade credit, bank lending and monetary policy transmission. European Economic Review, 50, 603-629.

Mian, S., Smith, C., 1992. Accounts receivable management. Journal of Finance 47, 169-200.

Nadiri, M., 1969. The determinants of trade credit in U.S. total manufacturing sector. Econometrica 37, 408-423.

Ng, C., Smith, J., Smith, R., 1999. Evidence on the determinants of credit terms in interfirm trade. Journal of Finance 54, 1109-1129.

Nilsen, J., 2002. Trade credit and the bank lending channel. Journal of Money, Credit and Banking 34, 226-253.

Petersen, M., Rajan, R., 1997. Trade credit: theories and evidence. Review of Financial Studies 10, 661-697.

Rauch, J. E., 1999. Networks versus markets in international trade. Journal of International Economics 48, 7-35.

Roodman, D., 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. Stata Journal 9(1), 86-136

Shirley, C. Winston, C., 2004. Firm inventory behavior and the returns from highway infrastructure investment. Journal of Public Economics 55, 398-415.

Smith, J., 1987. Trade credit and informational asymmetry. Journal of Finance 42, 863-876.

Tsoukalas, J.D., 2011. Input and output inventories in the UK, Economica 78, 460-479.

Wen, Y., 2011. Input and output inventory dynamics. American Economic Journal; Macroeconomics 3, 181-212.

Whited, T., 1992. Debt, liquidity constraints and corporate investment: Evidence from panel data. Journal of Finance 47, 1425-1460.

Wilner, B., 2000. The exploitation of relationships in financial distress: The case of trade credit. Journal of Finance 55, 153-178.

Wilson, N., Summers, B., 2002. Trade credit terms offered by small firms: survey and empirical evidence. Journal of Business, Finance and Accounting 29, 317-351.

Data Appendix

Definition of variables

TCextended= trade credit extended; balance sheet variable account receivables scaled by firm turnover

TCtaken = trade credit taken; balance sheet variable creditors scaled by firm turnover

NetTC = net trade credit; it is trade credit taken (*TCtaken*) minus trade credit extended (*TCextended*)

BankLoans = bank borrowings scaled by turnover

Total_Inv = total inventories scaled by turnover

There are four types of inventories in the French accounting system:

1. raw materials and consumables = the basic materials purchased from other firms to be used in the firm's production operations,

2. work in progress = low partially finished goods requiring (important) additional work before they become finished goods (more than 50% of the production process remains to do),

3. semi-finished and finished goods= high partially finished goods requiring (weak) additional work before they become goods for sale (less than 50% of the production process remains to do)

4. goods for sale= goods on which the production has been totally completed but that are not yet sold.

Proces_Inv = the sum of work in progress, semi-finished and finished goods, and goods for sale scaled by turnover

Profits = profit/loss for the period scaled by turnover

Liquidity = liquid assets (current assets minus inventories and accounts receivable) scaled by turnover

Risk = measures the probability that the firm will be in default in the near future. It takes 10 values (1-10), with higher values indicating higher risk. It is based on the Financial Score Conan-Holder (NPC) calculated as: NPC = 24*R1+22*R2+16*R3-84*R4-10*R5,

where

R1=operating cash flow excluding extraordinary items, interest, dividends and royalties / total debt

R2=long-term capital (equity + long-term debt) / balance sheet total assets

R3=[current realizable assets + cash] / balance sheet total assets

R4=interest expenses / net turnover

R5=personnel expenses / added value

Risk = 10 if NPC < -4, i.e. a 90% probability of default in a near future,
= 9 if -4 <= NPC < 0, i.e. there is 80% probability of default in a near future,
= 8 if 0 <= NPC < 2, i.e. there is 70% probability of default in a near future,
= 7 if 2 <= NPC < 5, i.e. there is 60% probability of default in a near future,
= 6 if 5 <= NPC < 6, i.e. there is 50% probability of default in a near future,
= 5 if 6 <= NPC < 8, i.e. there is 40% probability of default in a near future,
= 4 if 8 <= NPC < 10, i.e. there is 30% probability of default in a near future,
= 3 if 10 <= NPC < 13, i.e. there is 20% probability of default in a near future,
= 2 if 13 <= NPC < 16, i.e. there is 10% probability of default in a near future,
= 1 if NPC >= 16.

Our results are robust to using a less detailed definition of the variable risk.

Risk2 = 5 if NPC <-5,
= 4 if -5 <= NPC < 4,
= 3 if 4 <= NPC < 10,
= 2 if 10 <= NPC < 16,S
= 1 if NPC >= 16.

Size = logarithm of real total assets

Age = number of years since the firm was established

Differentiated = 1 if the manufacturing firm produces differentiated goods, 0 otherwise. See Sector classification of firms.

Standardized = 1 if the manufacturing firm produces standardized goods, 0 otherwise. See Sector classification of firms.

Services = 1 for non-manufacturing firms excluding *Retail* and *Wholesale*, 0 otherwise.

Retail = 1 for a retail firm, SIC code 50 and 52, 0 otherwise.

Wholesale = 1 for a wholesale firm, SIC code 51, 0 otherwise.

Pdiff = proportion of differentiated inputs in total inputs used by firms in the same industry. Values calculated using data from the input-output tables with 117 entries available from INSEAD.

Pserv = proportion of service inputs in total inputs used by firms in the same industry. Values calculated using data from the input-output tables with 117 entries available from INSEAD.

PropProces_Inv = proportion of processed inventories (work in progress, semi finished and finished goods) in total inventories.

Sector classification of firms

The classification of the manufacturers as differentiated or standardized is based on Rauch (1999). All other industries are classified as services.

UK SIC 2003	Manufacturing	Diff	Industry
15	Food products and beverages	0	S1
16	Tobacco products	0	S1
17	Textiles	0	S2
18	Wearing apparel; dressing and dyeing of fur	0	S2
19	Tanning and dressing of leather; luggage, handbags, saddlery harness and footwear	0	S2
20	Wood and products of wood and cork, except furniture; articles of straw and plaiting materials	0	S3
21	Pulp, paper and paper products; publishing and printing	0	S3
22	Publishing, printing and reproduction of recorded media	1	D1
23	Coke, refined petroleum products and nuclear fuel	0	S4
24	Chemicals and chemical products	0	S4
25	Rubber and plastic products	1	D2
26	Other non-metallic mineral products	0	S4
27	Basic metals	0	S4
28	Fabricated metal products, except machinery and equipment	1	D3
29	Machinery and equipment not elsewhere classified	1	D4
30	Office machinery and computers	1	D4
31	Electrical machinery and apparatus not elsewhere classified	1	D4
32	Radio, television and communication equipment and apparatus	1	D4
33	Medical, precision and optical instruments, watches and clocks	1	D4
34	Motor vehicles, trailers and semi-trailers	1	D5
35	Other transport equipment	1	D5
36	Furniture, manufacturing not elsewhere classified	1	D1

We distinguish four industry groups within the standardized sector (S1 to S4) and five industry groups within the differentiated sector (D1 to D5) in line with Bougheas, et al. (2009) and Blundell, et al. (1992). The last column of the table assigns the UK SIC 2003 codes to the nine industry groups. As we believe firm size is industry specific, we classify firms as large if their mean real assets are in the top third of the distribution of average real assets for all firms operating in the same industry group. For instance, firms operating in industry group S1 (food products and beverages, and tobacco products) are considered large if their average real assets over the sample period are in the top third of the distribution of mean real assets of all firms operating in industry group S1. Firms do not change their size category over time. For a similar approach see Brown et al. (2009).

Table 1. Sector composition

Industry	Freq.	Percent	Cum.
Differentiated Manufacturers	89,603	15.36	15.36
Standardized Manufacturers	52,190	8.95	24.30
Construction	121,609	20.84	45.15
Retail	93,994	16.11	61.26
Wholesale	70,516	12.09	73.34
Hotels	43,836	7.51	80.86
Finance	46,087	7.90	88.76
Real estate & others	65,594	11.24	100.00
Total	583,429	100.00	

Notes: The table gives the sector composition of our data. Firms are grouped into sectors on the basis of their SIC 2003 code. The period covered is 2000-2007. Manufacturing firms are divided into differentiated and standardized. See the data appendix for details.

Table 2A. Summary statistics - industrial sector

Variable	Manufacturing	Differentiated	Standardized	Construction	Retail
Trade credit extended	0.212	0.241	0.162	0.233	0.047
	(0.107)	(0.098)	(0.103)	(0.100)	(0.063)
Trade credit received	0.141	0.148	0.128	0.139	0.116
	(0.070)	(0.068)	(0.072)	(0.064)	(0.070)
Net trade credit (NetTC)	-0.071	-0.093	-0.034	-0.094	0.069
	(0.105)	(0.105)	(0.095)	(0.090)	(0.080)
Total_Inv	0.097	0.098	0.095	0.048	0.124
	(0.079)	(0.078)	(0.082)	(0.055)	(0.088)
Raw materials	0.045	0.045	0.045	0.019	0.001
	(0.046)	(0.046)	(0.047)	(0.023)	(0.005)
Proces_Inv	0.052	0.053	0.050	0.029	0.123
	(0.059)	(0.059)	(0.059)	(0.049)	(0.088)
BankLoans	0.062	0.057	0.071	0.036	0.062
	(0.082)	(0.075)	(0.093)	(0.045)	(0.083)
Risk	2.270	2.234	2.332	2.005	3.410
	(1.976)	(1.936)	(2.041)	(1.469)	(2.537)
Profits	0.031	0.033	0.028	0.036	0.021
	(0.045)	(0.045)	(0.044)	(0.033)	(0.029)
Liquidity	0.127	0.130	0.123	0.126	0.090
	(0.117)	(0.117)	(0.115)	(0.101)	(0.080)
Assets (ln)	2.881	2.823	2.981	2.092	2.646
	(1.283)	(1.187)	(1.429)	(0.891)	(1.002)
Sales (ln)	3.459	3.375	3.604	2.853	3.693
	(1.212)	(1.109)	(1.359)	(0.800)	(1.080)
Age	21.338	20.848	22.186	17.023	32.555
	(15.806)	(15.392)	(16.462)	(11.688)	(11.632)
Observations	153013	96889	56120	111154	86474

Table 2B. Summary statitics - size categories by industrial sector

Variable	Differentiated small	Differentiated large	Diff	Standardized small	Standardized large	Diff	Construnction small	Construnction large	Diff	Retail small	Retail large	Diff
Trade credit extended	0.237 (0.098)	0.248 (0.097)	0.000	0.150 (0.105)	0.185 (0.093)	0.000	0.213 (0.095)	0.271 (0.097)	0.000	0.045 (0.060)	0.054 (0.069)	0.000
Trade credit received	0.138 (0.066)	0.168 (0.069)	0.000	0.118 (0.071)	0.148 (0.068)	0.000	0.122 (0.056)	0.170 (0.067)	0.000	0.112 (0.068)	0.129 (0.075)	0.000
Net trade credit	-0.100 (0.105)	-0.080 (0.103)	0.000	-0.032 (0.095)	-0.037 (0.095)	0.000	-0.091 (0.088)	-0.101 (0.093)	0.000	0.067 (0.079)	0.075 (0.084)	0.000
Total_Inv	0.083 (0.072)	0.127 (0.081)	0.000	0.084 (0.079)	0.117 (0.084)	0.000	0.047 (0.051)	0.050 (0.062)	0.000	0.121 (0.089)	0.133 (0.083)	0.000
Raw materials	0.040 (0.044)	0.055 (0.048)	0.000	0.042 (0.047)	0.052 (0.047)	0.000	0.020 (0.024)	0.016 (0.021)	0.000	0.001 (0.006)	0.001 (0.004)	0.000
Proces_Inv	0.044 (0.053)	0.072 (0.063)	0.000	0.042 (0.055)	0.066 (0.062)	0.000	0.027 (0.044)	0.034 (0.058)	0.000	0.120 (0.089)	0.132 (0.083)	0.000
BankLoans	0.056 (0.074)	0.058 (0.077)	0.0008	0.074 (0.095)	0.066 (0.087)	0.000	0.038 (0.046)	0.032 (0.044)	0.000	0.059 (0.078)	0.071 (0.095)	0.000
Risk	2.276 (1.979)	2.153 (1.847)	0.000	2.408 (2.105)	2.183 (1.901)	0.000	2.022 (1.500)	1.972 (1.406)	0.000	3.473 (2.584)	3.221 (2.381)	0.000
Profits	0.033 (0.044)	0.033 (0.046)	0.0717	0.030 (0.043)	0.024 (0.044)	0.000	0.036 (0.033)	0.037 (0.033)	0.000	0.021 (0.029)	0.022 (0.029)	0.000
Liquidity	0.125 (0.112)	0.139 (0.127)	0.000	0.123 (0.111)	0.121 (0.123)	0.0491	0.116 (0.092)	0.147 (0.112)	0.000	0.088 (0.078)	0.098 (0.087)	0.000
Assets (ln)	2.159 (0.624)	4.113 (0.932)	0.000	2.178 (0.842)	4.541 (0.973)	0.000	1.606 (0.544)	3.034 (0.645)	0.000	2.273 (0.764)	3.768 (0.770)	0.000
Sales (ln)	2.770 (0.591)	4.552 (0.919)	0.000	2.840 (0.795)	5.088 (0.932)	0.000	2.428 (0.489)	3.678 (0.622)	0.000	3.365 (0.908)	4.679 (0.946)	0.000
Age	18.404 (13.308)	25.597 (17.861)	0.000	19.467 (14.419)	27.470 (18.744)	0.000	15.161 (10.719)	20.639 (12.609)	0.000	31.752 (11.310)	34.966 (12.240)	0.000
Observations	63973	32916		37060	19064		73375	37779		64884	21590	

Notes: The table reports means and standard deviations in parantheses. The sample period is 1999-2007 with the exception of firms in retail observed only from 2000 onwards. Trade credit extended and trade credit taken represent the balance sheet items account receivables and account payables, respectively, divided by the volume of sales. Net trade credit is the difference between trade credit taken and extended. Total_Inv stands for total inventories; Raw materials are inventories of raw materials only and Proces_Inv are inventories of work in progress and finished goods inventories. BankLoans represents short-term bank loans; Risk measures the likelihood of company failure, where a higher value indicates that the firm is more risky. Profits gives the firm's profit (or loss) for the period; Liquidity represents firm's liquid assets (cash, bank deposits, and other current assets). With the exception of Risk all other variables are scaled by total sales. Assets and Sales are the logarithm of firms real assets and sales, respectively. Age gives the number of years since the firm was extablished.

In Table 2A firms are separated according to the characteristics of their goods. Column 1 reports statistics for all manufacturing firms while columns 2 and 3 separate manufacturing firms into two sectors, differentiated and standardized.

In Table 2B firms are divided into two size categories within each sector. Firms are considered to be large if their mean real assets are in the top quarter of the distribution of the average real assets for all firms operating in the same sector and industry. Firms are not allowed to transit between categories. The column titled Diff reports the p-value of the t-test for the equality of means for small and large firms within each sector. See data appendix for more details.

Table 3. Trade credit extended – whole panel

Dependent variable: TCextended	(1) SYS GMM	(2) SYS GMM	(3) Hausman Taylor	(4) Hausman Taylor	(5) RE	(6) RE
Total_Inv	-0.517**		-0.054***		-0.056***	
	(0.245)		(0.003)		(0.002)	
Proces_Inv		-0.758***		-0.078***		-0.075***
		(0.263)		(0.003)		(0.003)
BankLoans	-0.030	-0.031	0.027***	0.027***	0.018***	0.019***
	(0.024)	(0.024)	(0.001)	(0.001)	(0.001)	(0.001)
Risk	-0.009***	-0.008**	-0.000***	-0.000**	-0.001***	-0.001***
	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)
Profits	-0.881***	-0.738***	0.026***	0.026***	0.032***	0.033***
	(0.186)	(0.183)	(0.003)	(0.003)	(0.003)	(0.003)
Liquidity	-0.339***	-0.324***	-0.174***	-0.174***	-0.158***	-0.158***
	(0.057)	(0.062)	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.009	-0.003	0.051***	0.051***	0.039***	0.039***
	(0.008)	(0.008)	(0.000)	(0.000)	(0.000)	(0.000)
Differentiated	0.092***	0.093***	0.089***	0.089***	0.089***	0.089***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Services	0.017	0.027***	0.074***	0.075***	0.066***	0.067***
	(0.013)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)
Retail	-0.102***	-0.065***	-0.099***	-0.095***	-0.099***	-0.096***
	(0.007)	(0.018)	(0.002)	(0.002)	(0.001)	(0.001)
Wholesale	0.025***	0.054***	0.008***	0.011***	0.013***	0.016***
	(0.004)	(0.013)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	583429	583429	583429	583429	583429	583429
Nr of id	82082	82082	82082	82082	82082	82082
m1 (p)	0.00	0.00				
m5 (p)	0.10	0.11				
Hansen (p)	0.00	0.11				
R-squared					0.25	0.10

Notes: The table reports coefficients and standard deviations in parantheses. The sample period is 2000-2007. The dependent variable is trade credit extended scaled by sales. Total_Inv stands for all inventories; Proces_Inv are work in progress and finished goods inventories; BankLoans represents short-term bank loans; Profits gives the firm's profit (or loss) for the period; Liquidity represents firm's liquid assets (cash, bank deposits, and other current assets). All these variables are scaled by sales. Risk measures the likelihood of company failure, where a higher value indicates that the firm is more risky.Size is the logarithm of real assets. Differentiated (manufacturers), Services, Retail, and Wholesale are dummies taking value 1 for firms in the respective sectors. The omitted category is Standardized (manufacturers). The same model is estimated with the system GMM (columns 1 and 2), Hausman-Taylor (columns 3 and 4), and the random effects estimator (columns 5 and 6). The table also reports the p-value for the Hansen test, for first-order (m1), and fifth-order (m5) serial correlation. The R-squared is reported in columns 5 and 6. See Notes to Table 2 and data appendix for more details. *, **, *** denote significance at 10, 5 and 1 percent level.

Table 4. Trade credit extended - GMM results for diversion theory

Dependent variable: TCextended	Differentiated (1)	Standardized (2)	Construction (3)	Retail (4)	Differentiated (5)	Standardized (6)	Construction (7)	Retail (8)
Total_Inv	-0.611***	-0.291**	-0.656***	-0.221**				
	(0.132)	(0.116)	(0.158)	(0.093)				
Proces_Inv					-0.899***	-0.393***	-0.676***	-0.229**
					(0.147)	(0.129)	(0.154)	(0.094)
BankLoans	0.101***	0.019	0.112**	0.039***	0.094***	0.021	0.107**	0.040***
	(0.019)	(0.015)	(0.048)	(0.015)	(0.020)	(0.015)	(0.048)	(0.015)
Risk	-0.009***	-0.007***	-0.000	0.001	-0.008***	-0.007***	-0.002	0.001
	(0.002)	(0.001)	(0.004)	(0.001)	(0.002)	(0.001)	(0.004)	(0.001)
Profits	-0.512***	-0.274***	-0.072	-0.132	-0.486***	-0.246***	-0.070	-0.136
	(0.071)	(0.073)	(0.146)	(0.105)	(0.068)	(0.069)	(0.147)	(0.105)
Liquidity	-0.247***	-0.221***	-0.354***	-0.014	-0.247***	-0.216***	-0.354***	-0.014
	(0.031)	(0.041)	(0.051)	(0.05)	(0.030)	(0.040)	(0.051)	(0.050)
Size	0.025***	0.024*	0.033***	0.001	0.027***	0.021	0.034***	0.008
	(0.010)	(0.013)	(0.010)	(0.007)	(0.010)	(0.013)	(0.010)	(0.007)
Observations	84679	48889	96828	74267	84679	48889	96828	74267
Number of firms	12210	7235	14326	12207	12210	7235	14326	12207
m1 (p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
m (p)	0.12	0.22	0.04	0.12	0.20	0.17	0.05	0.13
Hansen (p)	0.03	0.08	0.12	0.31	0.09	0.05	0.05	0.22

Notes: The table reports coefficients and standard deviations in parantheses. The sample period is 1999-2007 except for retail which covers 2000-2007. The dependent variable is the ratio of trade credit extended to sales. Total_Inv, Proces_Inv, BankLoans, Profits, and Liquidity are scaled by sales. Risk is a scale free measure of the likelihood of company failure. Size is the logarithm of real assets. The table also reports the p-value for the Hansen test, for first-order (m1) and second-order (m2) serial correlation. Columns 3 and 7 report the m3 and columns 4 and 8 the m4 test for serial correlation instead of the m2. See Notes to Table 2 and the data appendix for more details. *, **, *** denote significance at 10, 5 and 1 percent level.

Table 5A. Trade credit extended – size effects in all industries

Dependent variable:	Differentiated small	Differentiated large	Standardized small	Standardized large	Construction small	Construction large	Retail small	Retail large
TCextended	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total_Inv	-0.503***	-0.128	-0.276*	0.053	-1.193***	-0.445***	-0.191***	-0.002
	(0.131)	(0.170)	(0.147)	(0.131)	(0.163)	(0.156)	(0.057)	(0.120)
BankLoans	0.144***	0.019	0.051***	0.012	0.152***	0.179*	0.055***	0.025
	(0.022)	(0.043)	(0.016)	(0.038)	(0.037)	(0.103)	(0.011)	(0.018)
Risk	-0.008***	-0.003	-0.006***	-0.002	-0.002	0.006	-0.001*	-0.002
	(0.002)	(0.005)	(0.002)	(0.002)	(0.003)	(0.007)	(0.001)	(0.001)
Profits	-0.419***	-0.058	-0.201**	-0.167	-0.057	-0.435	-0.174***	-0.223*
	(0.076)	(0.153)	(0.078)	(0.124)	(0.114)	(0.268)	(0.055)	(0.128)
Liquidity	-0.241***	-0.153***	-0.170***	-0.188***	-0.345***	-0.304***	-0.011	-0.101*
	(0.037)	(0.049)	(0.045)	(0.054)	(0.056)	(0.078)	(0.028)	(0.059)
Size	-0.014	0.067***	-0.006	0.051**	0.017*	0.072***	-0.014***	-0.021*
	(0.009)	(0.025)	(0.014)	(0.020)	(0.009)	(0.023)	(0.004)	(0.011)
Observations	63545	21134	36686	12203	72562	24266	55734	18533
Number of firms	9139	3071	5422	1813	10826	3500	9150	3057
m1 (p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
m2 (p)	0.66	0.82	0.46	0.14	0.02	0.11	0.09	0.05
Hansen (p)	0.05	0.46	0.12	0.22	0.23	0.70	0.08	0.43

Notes: The table reports coefficients and standard deviations in parantheses. The sample period is 1999-2007 except for retail which covers 2000-2007. The dependent variable is the ratio of trade credit extended to sales. Total_Inv, BankLoans, Profits, and Liquidity are scaled by sales. Risk is a scale free measure of the likelihood of company failure. Size is the logarithm of real assets. Firms are considered to be large if their mean real assets are in the top quarter of the distribution of the average real assets for all firms operating in the same sector and industry. Firms are not allowed to transit between categories. The table also reports the p-value for the Hansen test, for first-order (m1) and second-order (m2) serial correlation. Columns 3, 4, and 6 report the m3 test for serial correlation instead of the m2. See Notes to Table 2 and the data appendix for more details. *, **, *** denote significance at 10, 5 and 1 percent level.

Table 5B. Trade credit extended – size effects in all industries

Dependent variable: TCextended	Differentiated small (1)	Differentiated large (2)	Standardized small (3)	Standardized large (4)	Construction small (5)	Construction large (6)	Retail small (7)	Retail large (8)
Proces_Inv	-0.854***	-0.596***	-0.290**	-0.039	-1.283***	-0.489***	-0.199***	0.013
	(0.165)	(0.191)	(0.145)	(0.161)	(0.165)	(0.148)	(0.058)	(0.123)
BankLoans	0.134***	0.061*	0.047***	0.013	0.139***	0.182*	0.056***	0.024
	(0.022)	(0.036)	(0.015)	(0.038)	(0.036)	(0.103)	(0.011)	(0.018)
Risk	-0.007***	-0.009***	-0.007***	-0.001	-0.004	0.005	-0.001*	-0.002
	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.007)	(0.001)	(0.001)
Profits	-0.402***	-0.586***	-0.180**	-0.139	-0.018	-0.450*	-0.177***	-0.220*
	(0.076)	(0.153)	(0.073)	(0.120)	(0.113)	(0.272)	(0.055)	(0.128)
Liquidity	-0.241***	-0.170***	-0.165***	-0.180***	-0.371***	-0.292***	-0.011	-0.100*
	(0.038)	(0.043)	(0.044)	(0.054)	(0.056)	(0.078)	(0.028)	(0.059)
Size	-0.010	0.045*	-0.004	0.057***	0.025***	0.071***	-0.014***	-0.021*
	(0.009)	(0.025)	(0.013)	(0.020)	(0.009)	(0.023)	(0.005)	(0.011)
Observations	63545	21134	36686	12203	72562	24266	55734	18533
Number of firms	9139	3071	5422	1813	10826	3500	9150	3057
m1 (p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
m2 (p)	0.82	0.08	0.38	0.17	0.07	0.11	0.10	0.05
Hansen (p)	0.17	0.37	0.09	0.23	0.47	0.63	0.08	0.46

Notes: The table reports coefficients and standard deviations in parantheses. The sample period is 1999-2007 except for retail which covers 2000-2007. The dependent variable is trade credit extended scaled by sales. Proces_Inv, BankLoans, Profits, and Liquidity are scaled by sales. Risk is a scale free measure of the likelihood of company failure. Size is the logarithm of real assets. Firms are considered to be large if their mean real assets are in the top quarter of the distribution of the average real assets for all firms operating in the same sector and industry. Firms are not allowed to transit between categories. The table also reports the p-value for the Hansen test, for first-order (m1) and second-order (m2) serial correlation. Columns 4, and 6 report the m3 test for serial correlation instead of the m2. See Notes to Table 2 and the data appendix for more details. *, **, *** denote significance at 10, 5 and 1 percent level.

Table 6. Trade credit taken – diversion and inventory management theories

Dependent variable: TCtaken	All	Small	Large	All	Small	Large	All	Small	Large
	SYS-GMM			Hausman-Taylor			Random Effects		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total_Inv	0.128***	0.129***	0.087	0.033***	0.039***	0.025***	0.038***	0.047***	0.022***
	(0.038)	(0.042)	(0.075)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)
BankLoans	-0.086***	-0.117***	-0.103**	-0.263***	-0.270***	-0.249***	-0.254***	-0.263***	-0.244***
	(0.029)	(0.033)	(0.050)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
Risk	0.017***	0.018***	0.021***	0.012***	0.013***	0.010***	0.013***	0.014***	0.010***
	(0.002)	(0.003)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Profits	0.085	0.050	0.190	-0.074***	-0.077***	-0.055***	-0.065***	-0.066***	-0.053***
	(0.070)	(0.069)	(0.179)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.004)
Liquid	-0.095***	-0.144***	0.012	-0.035***	-0.033***	-0.041***	-0.039***	-0.039***	-0.043***
	(0.024)	(0.028)	(0.047)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Size	0.004	0.004	0.038***	0.020***	0.027***	0.005***	0.014***	0.026***	-0.002***
	(0.006)	(0.006)	(0.014)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Age	-0.025***	-0.025***	-0.033***	-0.025***	-0.028***	-0.016***	-0.024***	-0.028***	-0.016***
	(0.004)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Pdiff	0.163***	0.133***	0.214***	0.143***	0.117***	0.222***	0.144***	0.116***	0.222***
	(0.012)	(0.012)	(0.019)	(0.004)	(0.005)	(0.008)	(0.004)	(0.004)	(0.008)
Pserv	-0.027***	-0.029***	-0.033*	-0.051***	-0.050***	-0.043***	-0.053***	-0.050***	-0.047***
	(0.008)	(0.007)	(0.018)	(0.003)	(0.003)	(0.005)	(0.002)	(0.002)	(0.005)
Retail	0.054***	0.052***	0.074***	0.086***	0.080***	0.096***	0.085***	0.079***	0.096***
	(0.007)	(0.008)	(0.017)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)
Wholesale	0.136***	0.138***	0.117***	0.141***	0.140***	0.133***	0.145***	0.141***	0.138***
	(0.008)	(0.008)	(0.015)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)
Observations	575731	431929	143802	575731	431929	143802	575731	431929	143802
Number of firms	81287	61160	20127	81287	61160	20127	81287	61160	20127
m1 (p)	0.00	0.00	0.00						
m5 (p)	0.46	0.76	0.48						
Hansen (p)	0.00	0.00	0.34						
rho				0.84	0.83	0.83	0.78	0.76	0.82
R-squared							0.25	0.28	0.22

Notes: The table reports coefficients and standard deviations in parantheses. The sample period is 2000-2007. The dependent variable is trade credit taken scaled by total assets. Total_Inv, BankLoans, Profits, and Liquidity are scaled by assets. Pdiff and Pserv denote the proportion of differentiated and service inputs used by firms (the proportion of standardized inputs is the reference category). Retail and wholesale are dummy variables taking the value 1 if firms operate in retail and wholesale, respectively. Firms are considered to be large if their mean assets are in the top quarter of the distribution of the mean assets for all firms operating in the same industry. The table also reports the p-value for the Hansen test, for first-order (m1), and fifth-order (m5) serial correlation. See Notes to Table 2 and the data appendix for more details.

Table 7. Trade credit taken – accounting for the proportion of processed inventories

Dependent variable: TCtaken	All	Small	Large	All	Small	Large	All	Small	Large
		SYS-GMM			Hausman-Taylor			Random Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total_Inv	0.155***	0.159***	0.152**	0.019***	0.024***	0.017***	0.023***	0.031***	0.015***
	(0.041)	(0.045)	(0.077)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)
BankLoans	-0.081***	-0.114***	-0.038	-0.267***	-0.273***	-0.254***	-0.259***	-0.267***	-0.250***
	(0.031)	(0.034)	(0.051)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
Risk	0.015***	0.016***	0.016***	0.013***	0.014***	0.011***	0.014***	0.015***	0.012***
	(0.003)	(0.003)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Profits	0.098	0.076	0.368**	-0.063***	-0.068***	-0.040***	-0.052***	-0.056***	-0.034***
	(0.070)	(0.071)	(0.173)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.004)
Liquid	-0.106***	-0.146***	-0.064	-0.040***	-0.039***	-0.046***	-0.045***	-0.044***	-0.051***
	(0.024)	(0.029)	(0.045)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Size	-0.000	-0.005	-0.002	0.015***	0.023***	-0.002***	0.011***	0.023***	-0.006***
	(0.006)	(0.007)	(0.012)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Age	0.160***	0.130***	0.237***	0.142***	0.117***	0.215***	0.141***	0.115***	0.216***
	(0.012)	(0.012)	(0.019)	(0.004)	(0.005)	(0.008)	(0.004)	(0.004)	(0.008)
Pdiff	-0.022***	-0.022***	-0.029***	-0.023***	-0.026***	-0.016***	-0.024***	-0.028***	-0.017***
	(0.004)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Pserv	-0.007	-0.018**	0.016	-0.027***	-0.029***	-0.013**	-0.030***	-0.029***	-0.017***
	(0.008)	(0.007)	(0.018)	(0.003)	(0.003)	(0.006)	(0.002)	(0.003)	(0.005)
Retail	0.066***	0.065***	0.089***	0.080***	0.074***	0.094***	0.081***	0.074***	0.095***
	(0.009)	(0.010)	(0.016)	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.003)
Wholesale	0.150***	0.157***	0.158***	0.138***	0.136***	0.134***	0.142***	0.138***	0.139***
	(0.009)	(0.010)	(0.016)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)
PropProces_Inv	-0.048***	-0.043**	-0.098***	-0.004***	-0.001	-0.017***	-0.005***	-0.001**	-0.020***
	(0.016)	(0.018)	(0.029)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	510719	382369	128350	510719	382369	128350	510719	382369	128350
Number of firms	73860	55357	18503	73860	55357	18503	73860	55357	18503
m1 (p)	0.00	0.00	0.00						
m5 (p)	0.86	0.60	0.78						
Hansen (p)	0.00	0.00	0.00						
rho				0.85	0.84	0.84	0.78	0.76	0.82
R-squared							0.26	0.29	0.24

Notes: See notes to Table 6 and Table 3. PropProces_Inv is the share of work in progress and finished goods inventories in all inventories. Firms are considered to be large if their mean real assets are in the top quarter of the distribution of the mean assets for all firms operating in the same industry. See Notes to Table 6 and the data appendix for more details.