Credit sales and advance payments: Substitutes or complements?

Simona Mateut [a,*], Piercarlo Zanchettin [b]

[a] *University of Nottingham, United Kingdom*
[b] *University of Leicester, United Kingdom*

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ABSTRACT

We investigate the interaction between supplier credit sales and customer advance payment. We find evidence that advance payments and credit sales are used as complementary terms of payment in international trade and in transactions of differentiated goods.

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1. Introduction

Firms use a variety of payment terms to settle their transactions of goods and services. When deciding payment terms, suppliers simultaneously determine their sales on trade credit, their demand for cash in advance, and their cash sales. This paper considers whether, depending on the characteristics of the trading partnership, firms use supplier credit and customer prepayment as substitute or complement payment terms.

Complementarity can arise for different reasons. Payment terms may offer trading partners a contractual solution to mutual informational asymmetries, whereby advance payments signal customer creditworthiness while credit sales guarantee seller product quality.[1] Furthermore, current advance payments can be a prerequisite for a customer to access trade credit in the future,

as anecdotal evidence suggests.[2] Finally, a seller might finance the extension of trade credit to financially constrained customers with the advance payments received from deep-pocket ones. One-side informational asymmetries or financial constraints, as typically assumed in the existing literature, would on the contrary tend to make trade credit and advance payments alternative terms of payment.[3] At any rate, whether the two terms of payment are complements or substitutes can play a significant role in the diffusion of adverse shocks affecting asymmetrically buyers and sellers.

We use a panel dataset of around 147,000 observations covering French firms over the period 1999–2007. The empirical model allows firms to both sell on credit and receive advance payments from their customers. Our results suggest that the relative use of the two terms of payment depends on the supplier–customer

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* Correspondence to: University of Nottingham, Jubilee Campus, Nottingham, NG8 1BB, United Kingdom. Tel.: +44 115 8468122; fax: +44 115 8466667.
E-mail address: simona.mateut@nottingham.ac.uk (S. Mateut).

[1] That credit sales may act as a signal of seller product quality was originally suggested by Smith (1987) and subsequently investigated both theoretically and empirically in the trade credit literature (e.g., Long et al., 1993). We argue here that high risk buyers may be attracted by the offer of trade credit, reinforcing the scope of advance payments as a signal of customer creditworthiness.

[2] For instance, the payment options offered by *SymCom* and *SSAC* entail international customers to gain access to trade credit via a sequence of advance payments (www.SymCom.com)

[3] Existing studies either consider separately the use of different payment terms (Pike et al., 2005) or focus on the relative use of net terms versus two-part trade credit terms (Ng et al., 1999). Eck et al. (2012) consider separately the case of exporter firms which condition larger export volumes on receiving advance payments from importers as a signal of creditworthiness, and the case of exporters that secure larger sales by signalling quality to importers through trade credit extension.

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relationship captured by the market scope (domestic vs. international), the transacted goods characteristics, and vendor size. We find that exporters, facing higher transaction risks, extend less trade credit than domestic firms. Although a large proportion of suppliers sell less on credit if they receive cash in advance from their customers, we show that small vendors of differentiated goods and exporters of standardized goods increase their credit sales if they receive advance payments.[4]

The following section presents our empirical methodology and data analysis. Section 3 presents our empirical results and the final section concludes.

2. Empirical methodology and data analysis

We use the following baseline specification to explain trade credit extension by firms:

$$TD_{it} = \alpha_i + \beta_1 CIA_{it} + \beta_2 Export_{it} + \beta_3 CIA_{it} * Export_{it}$$
$$+ \beta_4 X_{it} + d_t + v_{jt} + u_{it}$$

where TD is trade credit extended scaled by firm turnover. CIA is a dummy variable taking value 1 if firms receive advance payments, 0 otherwise. A negative coefficient β_1 implies that firms substitute the two terms of payment, i.e. they sell less on credit if they receive advance payments from their customers ($H1$). We gauge firm's export participation ($Export$) with two alternative variables: a dummy variable equal to 1 if the firm exports, 0 otherwise; and the volume of export sales. A negative β_2 implies that exporters extend less credit than firms selling on the domestic market as international transactions generally involve higher risks ($H2$). The interaction term $CIA_{it} * Export_{it}$ allows us to investigate the relationship between trade credit and advance payments in international trade. A positive and significant β_3 would indicate that exporters who receive advance payments increase their credit sales ($H3$).

The matrix of controls (X) includes the ratio of bank loans to sales ($BankLoans$), as it has been shown that trade credit extension depends on access to external finance allowing firms to continue production (Petersen and Rajan, 1997). The total stock of inventories scaled by sales ($Inventories$) measures the incentives firms have to increase sales (and reduce inventories) by offering trade credit (Bougheas et al., 2009; Daripa and Nilsen, 2011). Other controls include $Liquidity$ (liquid assets to sales), $Profits$ (profit for the period scaled by sales), a measure of the likelihood of company failure in the near future ($Risk$), firm Age (log) and firm $Size$ (1 if firm's total assets are in the lower third of the assets distribution for all firms in the same industry and year, 0 otherwise).

We expect trade credit usage to vary significantly across industries, but be rather similar within industries (Ng et al., 1999). To account for transacted goods characteristics, in line with Giannetti et al. (2011), we use the SIC industry codes to separate firms producing differentiated goods (often tailored to the needs of particular customers) from firms trading standardized (heterogeneous off-the-shelf) products. Thus, we control for sector-specific (v_{jt}), firm-specific (α_i), and time-invariant effects (d_t) in our estimations.

As firms simultaneously decide their credit sales, the advance payments demanded from their customers, their use of bank loans and their stocks of inventories, we lag these endogenous regressors when we apply the fixed effects estimator. Alternatively, we use an instrumental variable fixed effects estimator.[5]

We draw our sample from the Diane database collected by Bureau van Dijk for French manufacturing firms. Most firms in our sample are not quoted on the stock exchange. Firms with less than three consecutive yearly observations and the one percent tails for the main variables are dropped to control for the potential influence of outliers. The final sample includes about 147,000 observations over the period 1999–2007.

3. Empirical results

Tables 1 and 2 report the fixed effects and the instrumental variable fixed effects estimates, respectively. The tables present qualitatively similar results showing the robustness of our findings to the choice of estimator. The estimates in columns 1, 2, and 4 show that firms use supplier credit and cash in advance (CIA) as substitute terms of payment ($H1$). Consistent with the view that international transactions involve higher risks, exporters extend less trade credit (relative to sales) than firms selling at home ($H2$). Exporters receiving CIA do not significantly extend more credit than domestic firms not paid in advance by their customers, as evidenced by the insignificant coefficient associated with the interaction term $CIA_{it} * Export_{it}$.

Consistent with evidence that larger firms are more likely to receive CIA (Mateut, 2012) and to export (Greenaway et al., 2007) than their smaller counterparts, columns 3 and 5 present the estimates of the model augmented with interactions of our three main variables with vendor size. Importantly, the positive coefficient associated with $CIA_{it} * Export_{it}$ becomes highly significant suggesting that exporters increase their credit sales if they receive advance payments ($H3$). This result is consistent with the signalling role of CIA suggested by Eck et al. (2012). Since all interactions with $Size_{it}$ attract significant coefficients of opposite sign, both CIA substitution with trade credit and the countervailing effect of importer advance payments are weaker for small firms.

Trading specialized goods involves both higher seller uncertainty and stronger customer dependency on successful transactions. This increases both credit sales volumes (Cuñat, 2007; Giannetti et al., 2011) and the likelihood of advance payments (Mateut, 2012). Columns 6–9 report estimates for producers of differentiated vs. standardized products separately. We notice that credit sales and CIA are complements for all size types of exporters of homogeneous goods. Interestingly, in the differentiated sector, the coefficients for the main variables change sign across size classes (magnitudes for small firms are given by the sum of the coefficients for the interacted and non-interacted variables). Small producers of specific goods use credit sales and advance payments as complements. Export participation enhances credit sales of these firms, probably until they establish a reputation in foreign markets.

The following sensitivity tests confirm the results above: excluding purely domestic firms from our sample; changing the cut-off for the size classification to the lower quartile of the assets distribution for all firms in the same industry and year; replacing the sector-specific with more detailed industry-specific time effects. In separate tests, we replace the dummy variable CIA_{it} with the amount paid in advance (relative to sales). These results suggest that larger advance payments reduce the proportion of credit sales but we find weak evidence of a complementary role for advance payments. This suggests that not the *volume* but the *decision* to (partially) pay in advance can foster credit sales in international trade and in transactions of differentiated goods.

4. Conclusions

We show that, although many firms use supplier credit and cash in advance as substitutes, advance payments and credits sales are complementary terms of payment for some categories of firms, namely small vendors of differentiated goods and exporters of standardized goods.

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[4] Rooted in the risks surrounding international trade, the last result supports the signalling role of advance payments suggested by Eck et al. (2012) for international trading relationships. The importance of advance payments in international trade is also stressed by Ahn et al. (2011).

[5] We use the xtivreg2 command (Schaffer, 2010) using the first lag of the endogenous regressors as instruments.