Credit Relationships in the Great Trade Collapse. Micro Evidence From Europe

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Abstract

Using a rich sample of small and medium-sized European manufacturers, we study how banks' lending technologies affected firms' export activities during the 2009 great trade collapse. We find that bank-firm relationships mitigated the contraction of firms' export by easing banks' access to inside, "soft" information on export prospects. However, relationship banks with strong past experience on firms' domestic activities were less inclined to protect exporters. Bank-firm relationships appear to be a buffer especially for young and small exporters and for exporters at an early stage of internationalization.

JEL Codes: G21, D82, F10

Keywords: Bank-Firm Relationships, Lending Technologies, Trade

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1 Introduction

Along with the Great Financial Crisis of 2008-2009 came the Great Trade Collapse. Following the bankruptcy of Lehman Brothers, in the nine months from November 2008, international trade wrinkled by a record 22 percent implying a trade contraction even sharper than the epochal drop of 1930. Since the peak of the financial crisis preceded the abrupt contraction in trade, it became natural to think of financial factors as the main culprit behind the trade collapse. However, there is no consensus on the role that financial factors actually played in thwarting international trade (Baldwin, 2009). Various scholars identify the major cause of the trade collapse of 2009 in either the generalized fall in demand (Bricongne et al., 2012; Claessens et al., 2012; Nguyen and Qian, 2014) or the complex dynamics due to global value chains linkages (Altomonte et al., 2012).

Nevertheless, there are good reasons to study the part played by financial factors. Credit availability can be crucial for firms' export activities, affecting firms' decision to sell abroad and the volume of foreign sales (Manova, 2013; Minetti and Zhu, 2011). Engaging in an export activity entails sizeable fixed costs, some of which are sunk (Das et al., 2007). Moreover, export is particularly vulnerable to financial imperfections. For instance,

financiers may find it hard to obtain and verify information on foreign markets. This, in turn, may limit firms' ability to pledge export returns to their creditors.

The goal of this paper is to investigate whether the extent of trade impairment in 2009 – the time of most intense loan supply contraction – was affected by banks' lending technologies. In banking the production of a significant amount of information is decentralized (Berger and Udell, 2006). Loan officers often learn "soft" (private, non-codified) information through direct relationships with the firms they lend to, especially when hard, verifiable information on borrowers is scarce (Stein, 2002). Studying the impact of bank-firm relationships can then advance our understanding of the role of the credit market in the trade collapse. To this end, we exploit unusually rich information from a large survey, EFIGE, which covers manufacturing businesses in seven European countries (Austria, France, Germany, Hungary, Italy, Spain, and the United Kingdom). The data set provides detailed information on firms' trade activity based directly on firms' responses to survey questions. In particular, we have information on firms' export participation decisions, foreign sales, and patterns of entry in foreign markets. Most importantly for our purposes, the EFIGE survey includes precise questions on the trade collapse in 2009, in terms of firms' exports, imports and production abroad.

Firms in the EFIGE survey also answer several detailed questions about their access to bank credit, including the criteria the main bank follows in granting loans as well as details on credit relationships established with banks. We can then construct precise indicators of the tightness of bank-firm relationships. In particular, we can account for the multidimensional nature of credit relationships by distinguishing between two sets of indicators: measures of the access of the main bank to inside and up-to-date soft information about the firm and its export prospects; and measures of the previous experience of the main bank with the firm. In the former set (access to soft information), we include an indicator for the access of the bank to interviews with the firm's management and an indicator for the bank's access to information about the firm's current business plan and targets. In the latter set (previous experience with the firm), we include the length of the past relationship between the bank and the firm and the number of banks with which the firm has engaged in credit relationships in the recent past.

We find evidence that banks' access to soft information about firms moderates the drop in firms' export in 2009. Our estimates imply that if the main bank has access to interviews with the management of the borrowing firm, the firm is 4 percent less likely to experience a drop in the value of export activities compared to 2008 (a 5 percent reduction in the unconditional probability of an export drop). Similarly, the bank's access to information about the firm's current business plan and targets reduces the probability that the firm shrinks export by 3 percent. However, when we turn to considering indicators

of banks' previous experience with the borrowing firms, a more nuanced conclusion emerges about the impact of credit relationships on the resilience of firms' export during the crisis. A longer previous credit relationship and a more concentrated structure of recent bank-firm relationships (that is, a lower number of relationships) appear to somewhat exacerbate the export drop during the crisis. We put forward the hypothesis that, during the financial crisis, relationship banks with access to up-to-date, soft information were better able to protect firms from the contraction of information-intensive activities such as export. By contrast, having a previous long experience with a firm might have induced banks to especially protect activities on which they had become more accustomed in the past, such as domestic investment and production, rather than export. Consistent with this interpretation, we find that during the crisis on the one hand banks' access to soft information was less relevant for the resilience of less information-intensive domestic activities; on the other hand, a previous long relationship was less of a burden for such domestic activities.

To gain more intuition about our findings, we exploit details provided by the survey about the nature of the main bank and about the characteristics of firms' export activity. Having a foreign bank as the main lender reinforces the buffering effect of banks' access to soft information. This may indicate that foreign banks are especially able to acquire and decipher soft information about foreign activities and, hence, to support such activities during a crisis. At the same time, we do not expect foreign banks to manifest a bias in favor of domestic activities during a crisis. In fact, we find no evidence that having a foreign bank exacerbates the negative impact of previous experience on the resilience of export.[1] When we consider the characteristics of firms' export, we also document that for regular exporters the buffering effect of banks' access to soft information is diluted. This is again consistent with the above interpretation: more public knowledge is generally available about the export activities of regular exporters so that the benefit of banks' inside information should be less pronounced than for occasional exporters. And analogous results emerge when we focus on the characteristics (e.g., geographical distance) of export markets, as we elaborate below.

Finally, we explore the role of firm characteristics in the impact of bank lending technologies. Banks' access to soft information turns out to be particularly relevant for informationally opaque (e.g., younger, privately held and smaller) firms. Furthermore, it is especially beneficial for exporters that are at an early stage of internationalization (e.g., that export only to a single market).

The reader might have concerns about possible endogeneity issues. We have reasons to expect such concerns to be less relevant in our setting. Bank lending technologies

[1] The results turn out to be opposite for local banks that are tapped for the financing of foreign activities.

constitute a slow-moving feature of the links between firms and banks, as they are strongly driven by structural aspects such as the geographical distance between the bank and the borrowing firm or the organizational structure of the bank. For example, the geographical or organizational distance between banks and borrowing firms and between top managers and loan officers within the banking organizations have been found to be key determinants of the lending technologies adopted by banks (Alessandrini et al., 2010).[2] On the other hand, the shock that hit firms at the onset of the financial crisis occurred in a relatively unexpected and abrupt way at the end of 2008. Thus, we do not expect changes in export activities to cause the lending technologies adopted by banks. However, to further assuage possible concerns, we employ the approach adopted by Manova (2013) to isolate the impact of financial factors on firms' export, and originally proposed by Rajan and Zingales (1998) to tackle the possible endogeneity of financial factors. In particular, we test whether the impact of banks' lending technologies on firms' export is differentially stronger for firms that are more dependent on external finance for technological reasons purely related to the production process. And in further tests we also investigate whether the buffering effect of banks' access to soft information is stronger for more informationally opaque export products, as classified by Nunn (2007), and for businesses for which (shocks to the) organizational structure can hinder information transmission between managers and loan officers. The insights of the analysis are confirmed when we use these estimation approaches.

To summarize, our findings suggest that, during the financial crisis, credit relationships played a role in the resilience of firms' export to the shock. However, the results also suggest that not necessarily all the dimensions of the multifaceted bank-firm relationships acted as a buffer against the negative impact of the shock on export. Banks' access to up-to-date, inside information about the quality of export prospects appears to favor the buffering effect of credit relationships. However, banks' experience about previous activities of the firms may induce banks to protect domestic more than international activities, especially when the banks are local.

The remainder of the paper unfolds as follows. Section 2 relates the analysis to prior literature. Section 3 lays out testable hypotheses. In Section 4, we describe data and empirical methodology. Section 5 presents the main results. In Section 6, we carry out additional tests. Finally, Section 7 summarizes the key findings and draws policy implications.

[2] When a bank is large and has a highly hierarchical structure, it can be hard to transfer soft information from loan officers to the top management of the bank (Alessandrini et al., 2010).

2 Prior Literature

This paper relates to two strands of literature. The first strand studies the impact of the credit market on firms' export. Theoretical works underscore that export is particularly exposed to credit imperfections (see, e.g., Manova, 2013; Chaney, 2016). A firm has to devote time and pecuniary resources to identify an export market and undertake the adjustment needed to make its products suitable to that market (such as tailor its products to foreign tastes or conform them to the target country's regulations).[3] Moreover, because most export costs have to be paid up front, potential exporters must have enough liquidity at hand. In this literature, our work is linked to the micro-level empirical studies on the nexus between the credit market and firms' internationalization. Greenaway et al. (2007) find evidence of a link between firms' financial health and their participation in export markets. Minetti and Zhu (2011) use survey data from Italy and show that credit rationing reduces the probability of exporting both on the extensive and the intensive margin. On rich customs data from China, Manova et al. (2015) provide firm-level evidence that credit constraints hinder international trade.

Within the above strand of literature we especially contribute to two groups of recent studies. The first group looks specifically at the role of banks in firms' export. For example, Paravisini et al. (2015) use data from Peruvian firms and show that a contraction of bank funding reduces firms' export. The second group of studies document the link between financial crises and trade patterns. Chor and Manova (2012) document a negative impact of financial constraints on export during the recent financial crisis using aggregate/sectoral data on U.S. imports. Using firm-level data from six emerging economies in Asia, Coulibaly et al. (2011) disentangle the effect of falling demand from that of financial constraints on sales. Abiad et al. (2014) bring support to the view that financial constraints mattered in the 2009 trade collapse by examining the historical pattern of 179 episodes of financial crises. Berman et al. (2012) address the historical pattern of time-to-ship exports following financial crises while Cerutti and Claessens (2016) find a relationship between bilateral trade links and lender-borrower characteristics in the great cross-border bank deleveraging.

The paper also relates to the empirical literature on the role of bank lending technologies in firms' access to credit and investment decisions (Alessandrini et al., 2010; Degryse et al., 2009b; Sette and Gobbi, 2015; Herrera and Minetti, 2007). This literature suggests that banks lend to firms by means of a variety of technologies. Berger and Udell (2006) define a lending technology as a unique combination of primary information source, screening and underwriting policies/procedures, loan contract structure,

[3] These sunk costs include acquiring information on foreign markets, customizing products to fit local tastes and setting up distribution networks (Baldwin and Krugman 1989; Dixit 1989).

and monitoring strategies/mechanisms. Most papers focus on two classes of bank lending technologies: transaction-based lending technologies and relationship-based lending technologies (Berger and Udell, 2006; Bartoli et al., 2013). The two are normally distinguished by the information that banks use in granting and monitoring loans. Transactional lending technologies rely primarily on hard information (quantitative information, such as that derived from collateral guarantees), while relationship lending technologies hinge on soft information (qualitative information obtained via personal interactions between loan officers and firm managers and access to detailed documents of the firms). Berger and Udell (2006) distinguish two key dimensions within the multifaceted nature of relationship lending technologies. First, relationship banks have access to up-to-date soft information about borrowing firms. Second, relationship banks can count on a longer past experience with the firms. We return to this distinction below.

There is scarce empirical evidence on the link between credit relationships and firms' export, and even less so in the context of financial crises. Minetti and Zhu (2011) find that the duration of the credit relationship with the main bank does not affect the probability of exporting. De Bonis et al. (2015) suggest that the length of the firm–bank relationship enhances the probability of foreign direct investments but not that of exports. By contrast, focusing on small Italian firms, Bartoli et al. (2014) show that a longer relationship with the main bank increases the probability that firms enter foreign markets, but not the level of foreign sales. In this paper, we test the impact of credit relationships in shaping the resilience of trade during the crisis using detailed measures of different dimensions of the relationships based on firms' responses to survey questions.

3 Testable Hypotheses

While transactional lending technologies are based on banks' use of hard information, relationship lending technologies hinge on banks' collection of soft information about borrowers which is not easily reproducible by other financial institutions. Loan officers play a critical role in producing soft information about the borrowing firm both through direct contacts with the firm's management and through access to the firm's documents (e.g., Stein 2002; Berger and Udell 2002, Liberti and Mian, 2009). Berger and Udell (2012) and Uchida, Udell and Yamori (2012) stress however that transactional and relationship lending technologies constitute broad categories and that one should account for their multidimensional nature, trying to obtain precise measures of the mechanisms through which information is produced and accumulated (e.g., methods of contact, frequency of meetings, role of past experience vs. access to new information). In particular, bank-firm relationships entail two fundamental dimensions. There is a time/experience dimension:

the loan officers of a bank can progressively accumulate experience about a firm over time through repeated interactions with the firm (Berger, Miller, Petersen, Rajan and Stein, 2005; Liberti and Mian, 2009). Loan officers can however also acquire new, up-to-date soft information through interviews with the firm's managers, through access to the current business plan and targets of the firm, and through interactions with the firm over multiple financial products, such as the firm's cash account (Berger and Udell, 2006).[4]

Based on these two dimensions of relationship lending, we envisage two possible mechanisms through which credit relationships can affect the response of export activities during a crisis. On the one hand, the access to accurate, up-to-date information on a firm can allow a relationship bank to better assess the potential prospects of export activities and thus offer better protection to the exporter. This hypothesis draws on the literature underscoring the potential benefits of relationship lending on a firm's access to bank credit (Boot, 2000; Degryse et al., 2009a; Alessandrini et al., 2009). Moreover, this positive buffering effect is expected to be more pronounced during a financial crisis. For example, Ferri et al. (2001) study this issue on credit bureau micro-information for small and medium-sized enterprises (SMEs) covering the 1997 Korean financial crisis. For firms with stronger credit relationships, they find that outstanding loans and credit lines plunged less and the probability was lower that a previously non-delinquent firm built loans in arrears when liquidity constraints tightened. Sette and Gobbi (2015) investigate the impact of relationship lending on the transmission of the Lehman default shock to the supply of credit in Italy. They find that the growth of credit is higher and its cost lower when bank-firm relationships are stronger. Beck et al. (2018) show that relationship lending alleviates credit constraints during a cyclical downturn but not during a boom. The positive impact of relationship lending in a downturn is stronger for small and informationally opaque firms and in regions where the downturn is severe.

However, we also envisage a possible negative effect of credit relationships on the response of export during a crisis. The previous experience of a relationship bank with a firm could induce the bank to especially protect activities on which it has accumulated stronger past experience and on which it is able to extract larger rents in the future. For instance, relationship banks with past experience about the domestic activities of a firm could be inclined to support domestic investments more than export activities and risky investments in foreign markets. These arguments lead to our first main hypothesis.

Hypothesis 1. The impact of credit relationships on firms' export during a financial crisis is ambiguous a priori. Relationship banks' access to soft information on firms may support export plans, attenuating the export drop. However, relationship banks may also

[4] Proximity between the lender and the borrower facilitates the collection of soft information.

have the incentive to especially protect domestic activities on which they have accumulated stronger previous experience.

The richness of our database allows us to construct different measures of relationship lending technologies and of the way banks produce soft information about firms. This can help us isolate positive and negative effects of credit relationships on export during a crisis. In particular, as we detail below, we are able to distinguish between measures of banks' access to up-to-date soft information and measures of the experience previously accumulated by banks.

A further way to disentangle the possibly different effects of relationship lending is to consider characteristics of the bank, of the firm, and of the firm's export activity. For example, a local bank may be especially inclined to protect its previous experience about domestic activities. A foreign bank may instead be better able to acquire and interpret soft information about the future prospects of export. Similarly, the access to soft information about export may be more relevant in the case of a sporadic exporter than in the case of a regular exporter, on which more public information about export activities is probably available. And the buffering effect of credit relationships may be particularly strong when banks grant funds to small businesses for which information is traditionally scarce (Berger and Udell, 2006). This leads to a second set of testable hypotheses.

Hypothesis 2. Credit relationships are more likely to protect exporters during a crisis when the relationship bank is foreign, and when the exporter and its export activity are more informationally opaque (e.g., the firm is not a regular exporter or is smaller).

In what follows, we test these and additional predictions using rich data from European firms and their credit relationships.

4 Data and Methodology

4.1 Empirical methodology and data description

We analyze the role of credit relationships in firms' export activities during the first wave of the global financial crisis. To test our hypotheses we consider an empirical model of the probability that firms reduced their export during 2009 and of the contraction of export sales. The probability that the export of firm i drops during 2009 can be written as

$$\mathrm{P}(Drop_export = 1 | R_i, Z_i) = \Phi\left(\alpha_1 + R_i\beta_1 + Z_i\gamma_1\right), \tag{1}$$

where $\Phi(.)$ is the standard normal cumulative density function, R_i is a vector of proxies for the lending technology used by the main bank, and Z_i is a vector of control variables.

As for the change of export, we use the following specification

$$y_i = \alpha_2 + R_i\beta_2 + Z_i\gamma_2 + \varepsilon_{2i}, \tag{2}$$

where y_i is the export change between 2008 and 2009, ε_{2i} is the error term that captures the unobserved firm characteristics and any other unknown factor that may affect y_i and all the independent variables are as in equation (1).

Our main data source is the EU-EFIGE database which is collected within the EFIGE project (European Firms in a Global Economy: internal policies for external competitiveness) supported by the Directorate General Research of the European Commission through its 7th Framework Programme and coordinated by the Bruegel Institute. The data consist of a representative sample (at the country level) of manufacturing firms with more than 10 employees in seven European countries (Austria, France, Germany, Hungary, Italy, Spain, United Kingdom). The data were collected in 2010, covering the years from 2007 to 2009. To ensure standard statistical representativeness, the data set was built to fulfill two main criteria. First, the availability of an adequately large target sample of firms, set at around 3,000 firms for each large country (France, Germany, Italy, Spain and the United Kingdom) and some 500 firms for each small country (Austria and Hungary). Second, the sample was stratified to ensure ex-ante and ex-post representativeness of the collected data for each country, especially focusing on its composition by sectors, regions and size classes.

The data collection was carried out by a professional contractor, with the aim of gathering both qualitative and quantitative firm-level information. The database combines measures of firms' international activities (e.g., exports, imports, FDI) with quantitative and qualitative information on investment, innovation, labor organization, financing and organizational activities. Precisely, the questionnaire focuses on six broad areas of the surveyed firms: a) ownership structure; b) workforce characteristics (skills, type of contracts, domestic vs. migrant workers, training); c) investment, technological innovation, R&D (and related financing); d) exports and internationalization processes; e) market structure and competition; f) financial structure and firm-bank relationships. Importantly for our purposes, the survey also included specific questions on firms' behavior during the crisis.[5]

Table 1A, gathers descriptive statistics; Table 1B displays pairwise correlations among selected dependent and independent variables used in the analysis.[6] At the mean, the

[5] As the survey has been run in early 2010, information is mostly collected as a cross-section for the last available budget (year 2008), but several questions cover the 2007-09 period and/or the behavior of firms during the crisis.

[6] For each variable, in Table 1A we present summary statistics for all the firms for which information on the variable is available.

surveyed firms have been in business for 33 years; more than 60 percent of them have fewer than 50 employees (about 4 percent have more than 500 employees); 23 percent are part of a group. The majority of firms are located in Germany, France, Italy and Spain (76 percent of the total), while 16 percent are located in the United Kingdom, 4 percent in Hungary and 4 percent in Austria.

4.2 Export

Our goal is to study the role of credit relationships in supporting firms' export activities during the first wave of the financial crisis. The EFIGE survey addresses the firms that exported in 2008 with a rich set of questions on the impact of the crisis on export. For the baseline estimations, we focus on the primary question: "*During 2009, did you experience a reduction in terms of value of your export activities in comparison with 2008, or did your export increase or at least remain stable?*". Nearly 80 percent of the responding firms declare a reduction in exports in 2009 (Table 1A). Using this information, we construct the variable *Drop_export*, a dummy variable equal to one if the firm experiences a reduction in the value of its exports in 2009, zero otherwise. In all the tables, we also show the results obtained considering the percentage change in the value of exports between 2008 and 2009. On average, the change in export amounts to -13 percent.

4.3 Bank lending technology

We consider various indicators of banks' lending technology.[7] We capture key characteristics of the lending technologies through the answers to the question "*Which type of information does the bank normally have access to in order to assess your firm's creditworthiness?*" (F.16 in the EFIGE survey). In answering this question, firms had to choose among seven factors (with the possibility of multiple answers). We link the factors associated with the relationship lending technology in the Berger and Udell (2006) classification scheme. Under relationship lending, the bank primarily relies on soft (private, non-codified) information gathered through direct contacts with the firm. We then construct two indicators that reflect the access of the bank to up-do-date soft information about the firm and its business, including export activities: a dummy equal to one if the bank has access to interviews with the firm's managers on the firm's policy and prospects, zero otherwise; and a dummy equal to one if the bank has access to the firm's current business plan and targets, zero otherwise.[8] About 55 percent of the firms declare that

[7] Previous studies on SME finance suffer from the problem that the lending technologies are usually not identified (Kano et al., 2011). Our data allow us to capture the actual features of lending technologies.

[8] Although the business plan and firms' targets are quantitative measures, the fact that they are forward looking requires deciphering and makes them part of soft (not hard) information for the bank (Godbillon-

their main bank has access to interviews with the firm's managers, and for 48 percent of the firms the main bank has access to the firm's business plan and targets (Table 1A). In addition to these two measures, we also consider two other indicators of bank-firm relationships, the length of the main credit relationship and the number of banks with which the firm has been doing business in the recent past. We treat these two measures as proxies for the past experience of the bank with the borrowing firm. Petersen and Rajan (1994) show that the length of the credit relationship is a suitable measure of the experience garnered by the main bank; they also show that multiple credit relationships can dilute the relationship with the main bank. The average length of the relationship with the main bank is 16 years while the average number of banks is three. As shown in Table 1B, there is a slight positive correlation between the indicator for the main bank's access to interviews with the firm's managers and the length of the main credit relationship; the correlation between the indicator for the main bank's access to the firm's business plan and the length of the main credit relationship is instead slightly negative.

In addition to the measures of relationship lending, we also consider an indicator of transactional lending, a dummy that takes the value of one if the bank relies on collateral for quantitative information on the firm, zero otherwise (see Berger and Udell, 2006). For 55 percent of the firms, the main bank also uses information on the firm's collateral.

4.4 Control variables

In the regressions we control for a rich set of factors that could shape the response of firms' export to the crisis. To account for the fact that more productive and larger firms might less likely suffer from trade impairment, we include labor productivity (measured as value added per worker) and firm size (measured as log of total employees). We also include the firm's age, a dummy variable indicating whether the firm belongs to a group, the firm's financial leverage (given by the ratio of total loans to the sum of the total loans and the firm's assets), and its capital intensity (fixed assets per worker). To control for the firm's ownership structure, we include a dummy variable equal to one if the firm is a family business, zero otherwise (about 75 percent of the firms in the sample are family businesses). We also include sector dummies according to the two-digit NACE classification. Finally, we insert country dummies based on the country in which the firm is located.

4.5 Endogeneity issues

The nature of the shock that hit the firms at the onset of the crisis together with the long-term, slow-moving nature of bank lending technologies, due to their dependence on

Camus and Godlewski, 2005).

structural properties of the bank, tend to assuage concerns about possible endogeneity problems. To further assuage such concerns, we complement our estimates with the approach originally proposed by Rajan and Zingales (1998) and then adopted by Manova (2013) to help identify the impact of financial factors on firms' export activities. This consists of testing whether the impact of banks' lending technologies differs across firms characterized by a different degree of external financial dependence for technological reasons. As argued by Rajan and Zingales (1998), and by Manova (2013) for the case of exports, in certain sectors firms need more external funding and have to sustain larger up-front costs for technological reasons purely related to the production process. Being driven by technological factors, the measure of external financial dependence is unlikely to be endogenous to the degree of financial frictions faced by the firms.

We use two measures of external financial dependence. The first is based on a specific question in the survey that asks the firms whether their business is highly dependent on external finance for technological reasons. The second measure is borrowed from Rajan and Zingales (1998), who consider U.S. Compustat firms and capture the variation in sectoral financial dependence through the share of production costs that is not financed by internal cash flow. As pointed out by Rajan and Zingales (1998), what matters is the ranking of the financial dependence of the sectors. This ranking can be expected to largely reflect the technological features of the production process (while financial dependence does not vary substantially across firms within an industry).[9]

In addition to exploiting the variation in external financial dependence for technological reasons, in other tests we also exploit exogenous variation in the informational complexity of products and businesses. We expect the possible buffering effect of credit relationships during the crisis to be related to banks' access to soft information about export activities. Thus, we expect this buffering effect to be more pronounced for export products that are more informationally opaque. We then also present the estimates obtained by interacting our measures of bank lending technologies with the indicator of product information complexity constructed by Nunn (2007). This indicator is based on the extent to which products in a sector are traded in a thick market with many alternative buyers and sellers. Information on products that are traded in a thick market is generally deeper than for products that are highly specific. Following Nunn (2007), we construct a dummy variable that takes the value of one if the product is informationally complex, zero otherwise.

Finally, in other tests, we also exploit information in the survey on (shocks to) the

[9] The United States feature an advanced financial system and, on top of this, the Compustat firms considered by Rajan and Zingales (1998) to measure external financial dependence are arguably the least exposed to financial constraints. Rajan and Zingales (1998) thus maintain that, by looking at the sectoral financial dependence for the United States, one can make sure that differences in the degree of external financial dependence do not reflect the intensity of financial frictions.

organizational structure of the firm and the decentralization of its information to managers. These can affect the transmission of soft information from managers to loan officers. We return to this point below.

5 Baseline Results

An important advantage of our data is that they allow to isolate different dimensions of bank-firm relationships. As noted, we subdivide the indicators of relationship lending into two categories. The first category captures the access of the relationship bank to soft information about the firms' export prospects. In this first group, we include the bank's access to interviews with the management of the firm and the bank's access to the current business plan and targets of the firm. The second category of indicators of relationship lending capture the past experience of the bank with the activities of the firm. In this second group, we include the length of the main credit relationship and (as an inverse measure of credit relationship intensity) the number of banks with which the firm has recently being doing business.

Table 1B shows that the drop in firms' export in 2009 exhibits a mild negative correlation with the indicators for access to soft information and a mild positive correlation with the main relationship length. In Table 2A, we present the results for the effect of relationship lending on firms' export response to the crisis. In all the regressions, standard errors are heteroskedasticity robust, clustered at the country level. The indicators of banks' access to soft information consistently enter the regressions for the probability of export drop with negative signs and their coefficients are statistically significant at conventional levels (see columns 1-2 and 6). This suggests that relationship banks that have better access to soft, inside information about a borrowing firm are more inclined to protect their customer from the negative effects of the crisis, moderating the negative response of the firm's export to the external shock. The estimated coefficients imply that if the main bank has access to interviews with the firm's management, the borrowing firm is 4 percentage points less likely to suffer a drop in its export compared to 2008, which represents a 5 percent reduction in the unconditional probability of an export drop. And the bank's access to the firm's business plan reduces the probability of a drop in export by 3 percentage points. Similar conclusions emerge when we consider the effect on the change in the value of exports (columns 7-8 and 12): for instance, the estimates suggest that the main bank's access to interviews with the firm's management moderates the drop in export values by 2.6 percent. On the other hand, the indicators of the relationship banks' past experience with the firm turn out to have an opposite effect (see, e.g., columns 3-4 and 9-10). For example, firms with a longer relationship with the main bank appear to

suffer a stronger reduction in their export activities during the crisis, and the same holds for firms with a less fragmented structure of credit relationships (that is, with a smaller number of banks).[10]

As pointed out in previous studies that investigate the impact of financial factors on the intensive margin of export, it is useful to verify the robustness of the results to using a two stage estimation approach that accounts for a first-stage choice of export participation (see, e.g., Minetti and Zhu, 2011, and Manova, 2013). In our setting, we observe the drop in firms' export from 2008 to 2009 for firms that participated in the export market in 2008. To account for a possible self-selection into the export market, we also use a Heckman sample selection model by adding an inverse Mills ratio to equation (1). The Mills ratio is estimated from a first-stage probit of export participation in 2008 on the explanatory variables in equation (1) and on a dummy variable for whether the firm has some executives who worked abroad in previous years. We expect that the presence of such executives positively influence the long-term decision of export participation, while not directly exerting a role in the export drop in 2009. In the probit for export participation, we find a statistically significant positive impact of the dummy for executives with foreign work experience on the firm's export participation. We then estimate equation (1) by adding the inverse Mills ratio computed using these probit estimates. The results, reported in Table 2B, Panel A (columns 7-12), are virtually identical to those presented in Table 2A (carried over in columns 1-6 of the panel). In additional tests (available from the authors), we also considered Heckman selection estimates where identification relies only on the nonlinearity of the Mills ratio, obtaining again analogous results.

To further grasp the mechanisms at work, we can compare the effects of relationship lending on export activities with their effects on domestic activities. In Table 2B, Panel B, we test the impact of the measures of relationship lending on two indicators of domestic activities provided by the survey: the drop in the firm's workforce and the reduction of its planned investments. The results are remarkably different from those obtained for export. Banks' access to soft information appears to have no distinct role in protecting domestic activities (columns 1-12). If anything, the bank's access to information about the firm's business plan appears to somewhat raise the probability of a reduction of domestic investments (column 12).

Overall, the baseline estimates yield quite intriguing insights. Credit relationships appear to constitute a buffer against a negative response of export to the crisis especially to the extent that they ease banks' access to soft information about the firms' export prospects. However, relationship banks that have a longer past experience with their

[10] The results do not reveal a significant effect of the proxy for transactional lending technology, the reliance of the main bank on collateral (see columns 5 and 12).

customers might be more inclined to curtail credit for foreign activities than for domestic activities on which they have accumulated stronger previous experience.

5.1 Financial dependence and informational complexity

In the regressions we control for a rich set of factors that may shape the response of firms' export to the crisis. Further, as we discussed, the nature of bank lending technologies and of the sudden shock that hit firms at the onset of the crisis can help reduce the risk of endogeneity bias. The reader might however still be concerned about possible reverse causality. Cross-border activities may affect the choice of lending technologies used by the main bank or the firm's selection of its main bank. Moreover, the bank could decide to invest in soft information with an exporting firm to decrease the asymmetry of information inherent in the export process (information on foreign markets is difficult to verify for creditors). And one could wonder whether unobserved factors may concurrently affect lending technologies and the probability of a drop in export. The sign of this bias is unclear a priori.

To further assuage these possible concerns about endogeneity, we complement our estimates with the approach adopted by Manova (2013) and originally proposed by Rajan and Zingales (1998).[11] In Table 3, Panel A, we interact our measures of relationship lending technology with measures of external financial dependence driven by technological factors. Our first measure of external financial dependence is constructed using a specific question in the survey that asks the firms whether their business is highly dependent on external financing for technological reasons related to the production process. Using this question, we code a dummy variable equal to one if the firm answers that the business is highly dependent on external financing, zero otherwise.[12] The second indicator of sectoral external financial dependence is borrowed from Rajan and Zingales (1998). The results in Panel A reveal that the marginal effect of the measures of banks' access to soft information is significantly stronger for firms with higher external financial dependence.

In Table 3, Panels B-C, we instead exploit variation in the informational complexity of products and businesses. As noted, we use the indicator put forward by Nunn (2007) to test whether the impact of banks' access to soft information is stronger for products with higher informational specificity. Nunn (2007) uses data from the U.S. input–output tables and measures the specificity of a traded good with the proportion of its inputs that are highly

[11] Manova (2013) finds that liquidity constraints depress firms' export especially in industries with high external financial dependence.

[12] The survey further asks the firms more details about the degree of external financial dependence of their business. In Panel A, we then also experiment interacting the measures of relationship lending technology with a variable ("contin.") capturing the degree of external financial dependence.

specific (i.e., that are not sold on an organized exchange and, hence, do not have a thick market). The results in Panel B of Table 3 corroborate the argument that the buffering impact of banks' soft information is stronger for more informationally complex goods. Finally, in Panel C we exploit variation in the informational complexity of businesses. The survey asks each firm whether the process of decision making is centralized, with the owner retaining the control of decisions and information, or information is instead decentralized to managers. It also asks whether in recent years the control of decisions and information in the firm has been subject to shocks that have led to a process of decentralization towards managers. We expect personal relationships and the personal transmission of soft information between managers and loan officers to be easier when managers are delegated more information and decision making. In Panel C, we indeed find some evidence that the buffering effect of banks' access to soft information is stronger for firms where information and decision making are (or have become) more decentralized towards managers.

6 Disentangling the Channels

In this section, we exploit the detailed information provided by the survey on firm, bank and export characteristics to disentangle the mechanisms behind the baseline results.

6.1 Bank characteristics

Theory suggests that the type of the bank matters in the process of production of soft information about a borrowing firm. For example, large banks may have a comparative advantage in transactional lending, while small/local banks may have an edge in relationship lending (Stein, 2002). Moreover, an imperfect firm-type/bank-type match could result into more severe financial constraints for borrowing firms (Ferri and Murro, 2015).[13]

In Table 4, we exploit the information provided by the survey on the nature of the main bank. The survey gives comprehensive details on the characteristics of the main bank, and in particular it asks each firm whether its main bank is foreign or domestic. It further asks if the bank is tapped for the financing of domestic-oriented activities or foreign-oriented activities, such as export. This question may help capture a possible mismatch between the nature of the bank and the nature of the activities carried out by the firm. Finally, each firm is asked if, according to its knowledge, the main bank has an

[13] Ferri and Murro (2015) find that an imperfect matching between firm and bank could increase the probability of credit rationing. In fact, if the business technology employed by the bank turns out to be inappropriate to the needs of the borrower, then that imperfect match might amplify the asymmetries of information.

international network of branches and subsidiaries. Using these questions, we construct three dummies: "foreign bank", "domestic bank for foreign activities", and "bank with international network", which, respectively, take the value of one if the bank is of the specified nature, zero otherwise.

The estimates in Table 4, Panel A, reveal that foreign banks engaging in credit relationships are particularly inclined to protect firms' export when the credit relationship takes the form of access to soft information. In particular, when we consider the change in the value of export, the estimated coefficient on the interaction between access to interviews with the firm's management and the foreign bank dummy is significantly positive (see column 5). The same conclusion applies when we look at the estimated coefficient on the interaction between access to the firm's business plan and the foreign bank dummy (see columns 2 and 6). On the other hand, the coefficients on the interactions of the dummy for foreign bank with the length of the main credit relationship and with the number of banks are not significantly different from zero (columns 3-4 and 7-8). This may suggest that foreign banks have no reason to protect previous experience with domestic activities, on which they have probably accumulated less experience than domestic banks. In contrast with the results for foreign banks, we obtain that for firms that tap a local relationship bank for the financing of foreign activities, banks' access to soft information has a less pronounced buffering effect (see Panel B, columns 10, 13, and 14). This can reflect the poorer soft information that local banks can acquire on foreign activities, relative to foreign banks.[14]

Finally, in Panel C we explore the role of the availability of an international banking network. Consistent with the results for the foreign nature of relationship banks, we find some evidence that banks with an international network of affiliates have a higher propensity to buffer exporters from the negative shock (see column 1).

6.2 Export characteristics and markets

In Table 5 we investigate the role of export characteristics. We expect the informational benefit of credit relationships to be especially strong for firms that are not regular exporters. In fact, regular exporters are likely to have higher informational transparency, due to more public knowledge about their foreign activities. Based on a specific question in the survey, we construct a dummy variable that takes the value of one if the firm is a regular exporter, zero otherwise. Consistent with the above argument, in Panel A of Table 5, columns 1 and 5, we estimate, respectively, a positive and a negative coefficient

[14] Domestic banks that are tapped to fund foreign activities appear to mitigate the negative impact of the relationship length on the resilience of export during the crisis (column 11). Again, this result contrasts with that obtained for foreign banks.

on the interaction between the indicator for banks' access to interviews with the firm's management and the dummy for regular exporter: the buffering effect of banks' access to soft information is thus less relevant in the case of regular exporters. On the other hand, we do not expect that being a regular exporter exerts a direct role in the link between the credit relationship length and the export drop; in fact, a longer previous experience with a regular exporter could mitigate any incentive to penalize his export activities. The estimated coefficient on the interaction between credit relationship length and the dummy for regular exporter is not statistically significant (column 3).

In Panel B of Table 5, we distinguish among export markets. Limited by the data, we define markets in terms of broad geographical areas. In our sample, 28 percent of exporters sell to a single foreign market and nearly 83 percent of them choose the EU market. We expect the buffering effect of banks' access to soft information to be stronger for closer export markets, for which soft information is probably easier to decipher, and indeed in column 10 we estimate a negative coefficient on the interaction between the dummy for other EU markets and the indicators for banks' access to information.

Previous studies also suggest that, since it usually takes time for a firm to expand into a new market, firms that serve multiple markets are more likely to be established exporters, to be producers of high quality goods, and to be technically efficient (Eaton et al., 2008). Multiple markets exporters may also better diversify demand risk. Moreover, while in principle serving multiple foreign markets may involve extra entry costs, we expect the cost of entering additional foreign markets to be lower than the fixed cost of beginning an export activity.[15] Overall, these arguments suggest that during a financial crisis single market exporters might benefit more from the protection of credit relationships than multiple markets exporters. In line with these observations, we find a stronger impact of banks' access to soft information on export for firms that serve a single foreign market than for firms that serve multiple foreign markets (column 13 of Panel B).

6.3 Firm characteristics

In the previous two sections, we focused on the characteristics of banks and export activities. In this section, we aim at gaining additional insights into the mechanisms driving our results by focusing on the characteristics of exporting firms. We consider a battery of firm characteristics to study whether the buffering role of relationship banks' soft information is stronger for exporters with higher informational opacity. We capture firms'

[15] Some of the fixed entry costs can be spread across markets: the knowledge firms have gained in their first export market may be applied to other export markets. Furthermore, firms may not need to further adjust their production line and internal organization when entering additional markets. Overall, this may reduce the fixed costs for entry into additional export markets (Minetti and Zhu, 2011).

informational opacity considering the size (sales) of the firm, its age, and its public listing status. Small and young firms are reputed to be informationally opaque because generally they are not covered by financial analysts or the financial press. Similarly, firms that are not publicly listed are less subject to public scrutiny.

In Table 6, we report the results on subsamples based on firm age, size, and ownership structure. We estimate a stronger marginal effect of the measures of banks' access to soft information for small and young firms than for bigger and older firms. For example, as shown in columns 1-4 of Panel A, while in the case of young firms (below the median age) the estimated coefficient is negative and statistically significant for both the indicators of access to soft information (interviews with managers and access to information on the business plan), for older businesses the estimated coefficients are statistically insignificant. Analogously, the results in Panel B of Table 6 suggest that banks' access to soft information mitigates the export drop for smaller firms – i.e., those with less than 10 million sales – but not for larger firms. Thus, the estimated benefit of relationship lending on SMEs' exports could stem from strong bank-firm relationships reducing credit rationing in a crisis especially for smaller firms (Beck et al., 2018).

In Panel C, we split the sample based on whether the firm is publicly listed or not. Consistent with the arguments above, in columns 1-4 we uncover a stronger effect of banks' access to soft information for publicly listed firms than for privately held ones.[16]

7 Conclusion

In this paper we have investigated whether credit relationships affected the extent to which firms' international trade was damaged during the 2009 credit crunch. In a large sample of European manufacturers, we have found that the use of relational lending technologies reduced the extent of trade collapse by promoting banks' access to soft information on exporters. Specifically, relationship banks' access to soft information lessened the probability of firms suffering a drop in export in 2009. However, we have also uncovered some evidence that a stronger previous experience with firms' domestic activities did not necessarily induce relationship banks to buffer exporters from the impact of the crisis. We have further found that the buffering effect of credit relationships on exports especially benefited informationally opaque firms, such as young and small-sized businesses, and firms with an opaque governance structure, such as privately held firms. Further, it especially

[16] The corporate governance literature points out that family businesses are often informationally opaque (Bianco et al., 2013). For example, Cucculelli et al. (2016) suggest that family owners could have the incentive to disguise information on the firm's activities in order to keep tight control over the firm. In untabulated tests, we find weak evidence of a stronger beneficial effect of (the proxies for) the access to soft information for family firms.

manifested itself in the case of sporadic exporters or exporters with scarce experience of foreign markets (e.g., operating in a single foreign market). On the other hand, on the downside of credit relationships, local banks appear to have especially protected domestic activities on which they acquired previous experience, rather than export activities. These results are robust to using a variety of estimation approaches, and also survive when we account for possible endogeneity of bank lending technologies.

Our evidence contributes to the debate on whether the Great Trade Collapse of 2009 was related to the concurrent credit crunch. An implication of the analysis is that a non-trivial share of SMEs and young firms may have been spared to give up exporting thanks to their main bank adopting relationship lending technologies. However, the results also offer a nuanced perspective on the buffering effect of credit relationships for export. Credit relationships appear to represent a buffer especially when they ease the acquisition of banks' information about the prospects of export activities. They may however weaken the resilience of exporters if they materialize in banks' accumulation of experience with firms' domestic activities, possible biasing banks towards the protection of such activities.

Our findings not only have a bearing towards a better understanding of the economic dynamics in 2009 but also offer potential suggestions in view of the prolonged banking instability in Europe. In the face of an external shock, banks' ability to ascertain borrowers' risk class – owing to access to soft information – can attenuate the extent to which the shock is transmitted to the real sector. This is particularly the case for the possible damage to international trade, the most dynamic outlet for European firms' sales. In a sense, by helping prevent that loss, relationship banks create positive spillovers and may limit the accumulation of macroeconomic risk. But the mechanistic method of the risk weighted asset approach (e.g., Basle 2 and 3) seems unable to account for such possible benefits created by relational banks. Therefore, banking regulation should probably also encompass banking business models in evaluating the true risk behind banks (Ayadi et al., 2012).

References

Abiad, A., Mishra, P., Topalova, P. (2014). How does trade evolve in the aftermath of financial crises?. IMF Economic Review 62.2, 213–247.

Alessandrini, P., Presbitero, A. F., Zazzaro, A. (2009). Banks, distances and firms' financing constraints. Review of Finance 13, 261–307.

Alessandrini, P., Presbitero, A. F., Zazzaro, A. (2010). Bank size or distance: what hampers innovation adoption by SMEs?. Journal of Economic Geography 10, 845–881.

Altomonte, C., Di Mauro, F., Ottaviano, G., Rungi, A., Vicard, V. (2012). Global value chains during the great trade collapse: a bullwhip effect?. European Central Bank working paper No. 1412, January.

Ayadi R., Arbak E., de Groen W.P. (2012). Regulation of European banks and business models: Towards a new paradigm?, Brussels: CEPS.

Baldwin, R., Krugman, P. R. (1989). Persistent trade effects of large exchange rate shocks. Quarterly Journal of Economics 104, 635–654.

Baldwin, R. (2009). The great trade collapse: Causes, consequences and prospects. CEPR for VoxEU.org.

Bartoli, F., Ferri, G., Murro, P., Rotondi, Z. (2013). SME financing and the choice of lending technology in Italy: Complementarity or substitutability?. Journal of Banking and Finance 37, 5476–5485.

Bartoli, F., Ferri, G., Murro, P., Rotondi, Z. (2014). Bank support and export: evidence from small Italian firms. Small Business Economics 42, 245–264.

Beck, T., Degryse, H., De Haas, R., van Horen, N. (2018). When arm's length is too far. Relationship banking over the credit cycle. Journal of Financial Economics 127, 174–196.

Berger, A.N., Miller, N.H., Petersen, M.A., 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.

Berger, A.N., Udell, G.F. (2006). A more complete conceptual framework for SME finance. Journal of Banking and Finance 30, 2945–2968.

Berger, A.N., Udell, G.F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. Journal of Banking and Finance 22, 613–673.

Berman, N., de Sousa, J., Martin, P., Mayer, T. (2012). Time to ship during financial crises. NBER International Seminar on Macroeconomics 2012. University of Chicago Press.

Bianco, M., Bontempi, M.E., Golinelli, R., Parigi, G. (2013). Family firms' investments, uncertainty and opacity. Small Business Economics 40, 1035–1058.

Boot, A.W.A. (2000). Relationship banking: what do we know?. Journal of Financial Intermediation 9, 7–25.

Bricongne, J. C., Fontagné, L., Gaulier, G., Taglioni, D., Vicard, V. (2012). Firms and the global crisis: French exports in the turmoil. Journal of International Economics 87, 134–146.

Caprio, G., Laeven, L., Levine, R. (2007). Bank valuation and corporate governance. Journal of Financial Intermediation 1, 584–617.

Cerutti, E., Claessens, S. (2016). The great cross-border bank deleveraging: supply constraints and intra-group frictions. Review of Finance, forthcoming.

Chaney, T. (2016). Liquidity constrained exporters. Journal of Economic Dynamics and Control 72, 141–54.

Chor, D., Manova, K. (2012). Off the cliff and back? Credit conditions and international trade during the global financial crisis. Journal of International Economics 87, 117–133.

Claessens, S., Tong, H., Wei, S.J. (2012). From the financial crisis to the real economy: Using firm-level data to identify transmission channels. Journal of International Economics 88, 375-387.

Coulibaly, B., Sapriza, H., Zlate, A. (2011). Trade credit and international trade during the 2008-09 global financial crisis. Federal Reserve Board, International Finance Discussion Papers Number 1020.

Cucculelli, M., Peruzzi, V., Zazzaro, A. (2016). Relational capital in lending relationships: Evidence from European family firms. Money and Finance Research group (Mo.Fi.R.) working papers No. 128.

Das, S., Roberts, M.J., Tybout, J.R. (2007). Market entry costs, producer heterogeneity, and export dynamics. Econometrica 75, 837–873.

De Bonis, R., Ferri, G., Rotondi, Z. (2015). Do firm–bank relationships affect firms' internationalization? International Economics 142, 60–80.

Degryse, H., De Jonghe, O., Jakovljevic, S., Mulier, K., Schepens, G. (2016). The impact of bank shocks on firm-level outcomes and bank risk-taking, mimeo, Katholieke Universiteit Leuven.

Degryse, H., Kim M., Ongena S. (2009a). Microeconometrics of Banking, Oxford University Press.

Degryse, H., Laeven, L., Ongena, S. (2009b). The impact of organizational structure and lending technology on banking competition. Review of Finance 13, 225–259.

De Haas, R., Van Horen, N. (2013). Running for the exit? International bank lending during a financial crisis. Review of Financial Studies 26, 244–285.

Dixit, A. (1989). Entry and exit decisions under uncertainty. Journal of Political Economy 97, 620–638.

Eaton, J., Eslava, M., Kugler, M., and Tybout, J. (2008). Export dynamics in Colombia: transactions level evidence. Borradores de Economia Working Paper no. 522, Banco de la Republica de Colombia.

Eichengreen, B., O'Rourke K.H. (2009). A Tale of Two Depressions, VoxEU.org.

Ferri, G., Kang, T.S., Kim, I.J. (2001). The value of relationship banking during financial crises: Evidence from the Republic of Korea. Vol. 2553. World Bank Publications.

Ferri, G., Murro, P. (2015). Do firm-bank "odd couples" exacerbate credit rationing?. Journal of Financial Intermediation 24, 231–251.

Ferri, G., Murro, P., Peruzzi, V., Rotondi, Z. (2017). Bank lending technologies and credit availability in Europe. What can we learn from the crisis? CERBE Working Paper No.17.

Godbillon-Camus, B., Godlewski, C.J. (2005). Credit risk management in banks: Hard information, soft information and manipulation. MPR paper No. 1873, December.

Greenaway, D., Guariglia, A., Kneller, R. (2007). Financial factors and exporting decisions. Journal of International Economics 73, 377–395.

Hauswald, R., Marquez, R. (2006). Competition and strategic information acquisition in credit markets. Review of Financial Studies 19, 967–1000.

Herrera, A. M., Minetti, R. (2007). Informed finance and technological change: Evidence from credit relationships. Journal of Financial Economics 83, 223–269.

Kano, M., Uchida, H., Udell, G.F., Watanabe, W. (2011). Information verifiability, bank organization, bank competition and bank–borrower relationships. Journal of Banking and Finance 35, 935–954.

Liberti, J.M., Mian, A.R. (2009). Estimating the effect of hierarchies on information use. Review of Financial Studies 22, 4057–4090.

Manova, K. (2013). Credit constraints, heterogeneous firms, and international trade. Review of Economic Studies 80, 711–744.

Manova, K., Wei, S.J., Zhang, Z. (2015). Firm exports and multinational activity under credit constraints. Review of Economics and Statistics 97, 574–588.

Minetti, R., Murro, P., Rotondi, Z., Zhu, S. (2016). Financial constraints, firms' supply chains and internationalization. CERBE Working Paper No. 7.

Minetti, R., Murro, P., Zhu, S. (2015). Family firms, corporate governance and export. Economica 82, 1177–1216.

Minetti, R., Zhu, S. (2011). Credit constraints and firm export: Microeconomic evidence from Italy. Journal of International Economics 83, 109–125.

Nguyen, H., Qian, R. (2014). Demand collapse or credit crunch to firms? Evidence from the World Bank's financial crisis survey in Eastern Europe. Journal of International Money and Finance 47, 125–144.

Nunn, N. (2007) Relationship-specificity, incomplete contracts, and the pattern of trade. Quarterly Journal of Economics 122, 569–600.

Paravisini, D., Rappoport V., Schnabl, P., Wolfenzon, D. (2015). Dissecting the effect of credit supply on trade: Evidence from matched credit-export data. Review of Economic Studies 82, 333–359.

Petersen, M. A., Rajan, R. G. (1994). The benefits of lending relationships: Evidence from small business data. Journal of Finance 49, 3–37.

Rajan, R.G., Zingales, L. (1998). Financial dependence and growth. American Economic Review 88, 559–586.

Sette, E., Gobbi, G. (2015). Relationship lending during a financial crisis. Journal of the European Economic Association 13, 453–481.

Stein, J.C. (2002). Information production and capital allocation: Decentralized vs. hierarchical firms. Journal of Finance 57, 1891–1921.

Uchida, H., Udell, G.F., Yamori, N. (2006). SME financing and the choice of lending technology. RIETI Discussion Paper Series 06-E-025.

Uchida, H., Udell, G. F., and Yamori, N. (2012). Loan officers and relationship lending to SMEs. Journal of Financial Intermediation 21, 97–122.

Table 1A: Summary Statistics

	Num.	Mean	Std. Dev.	Description
Main dependent variables				
Drop export	6767	0.809	*0.393*	Dummy that takes the value of one if the firm experiences a reduction in the value of its exports in 2009, zero otherwise.
Change export	6767	-0.133	*0.308*	Percentage variation in export sales between 2008 and 2009 in real terms.
Drop workforce	12132	0.496	*0.500*	Dummy that takes the value of one if the firm experiences a reduction of the total workforce in 2009, zero otherwise.
Reduction investments	10331	0.465	*0.499*	Dummy that takes the value of one if the firm experiences a reduction of planned investments in 2009, zero otherwise.
Lending technologies				
Interviews	6864	0.560	*0.496*	Dummy that takes the value of one if the bank has access to interviews with the firm's management on the firm's policy and prospects, zero otherwise.
Business plan	6865	0.476	*0.499*	Dummy that takes the value of one if the bank has access to the firm's business plans and targets, zero otherwise.
Collateral	6856	0.552	*0.497*	Dummy that takes the value of one if the bank can rely on collateral, zero otherwise.
Relationship length	6754	16.103	*14.031*	Length of the main credit relationship.
Number of banks	12424	3.179	*2.596*	Number of banks with which the firm does business, zero otherwise.
Control variables				
Age	12467	32.570	*28.348*	Number of years since inception.
Number of employees	12501	3.468	*1.032*	Total number of employees in the year of the survey, in logs.
Labour productivity	9104	0.511	*0.410*	Value added per worker.
Capital intensity	10095	0.413	*0.818*	Fixed assets per worker.
Family	12043	0.759	*0.428*	Dummy that takes the value of one if the firm is family owned.
Leverage	12007	0.377	*0.110*	The ratio of total loans to the sum of the total loans and the firm's assets.
Group	12501	0.232	*0.422*	Dummy that takes the value of one if the firm belongs to a group.
Austria	12501	0.035	*0.184*	Dummy that takes the value of one if the firm is located in Austria, zero otherwise.
France	12501	0.238	*0.426*	Dummy that takes the value of one if the firm is located in France, zero otherwise.
Germany	12501	0.054	*0.227*	Dummy that takes the value of one if the firm is located in Germany, zero otherwise.
Hungary	12501	0.039	*0.194*	Dummy that takes the value of one if the firm is located in Hungary, zero otherwise.
Italy	12501	0.242	*0.428*	Dummy that takes the value of one if the firm is located in Italy, zero otherwise.
Spain	12501	0.226	*0.419*	Dummy that takes the value of one if the firm is located in Spain, zero otherwise.
United Kingdom	12501	0.165	*0.372*	Dummy that takes the value of one if the firm is located in the United Kingdom, zero otherwise.

Note: This table reports summary statistics and description for the main variables used in the analysis.

Table 1B: Correlation Matrix

	Drop export	Change export	Drop workforce	Reduct. investm.	Interview	Business plan	Relat. length	Number of banks	Collateral	Age	Labour product.	Capital Intensity	Family	Leverage	Group
Drop Export	1														
Change export	-0.579	1													
Drop workforce	0.150	-0.221	1												
Reduction investments	0.119	-0.196	0.295	1											
Interviews	-0.057	0.030	0.010	0.049	1										
Business plan	-0.059	0.026	0.000	0.045	0.477	1									
Relationship length	0.080	-0.042	-0.006	0.002	0.034	-0.036	1								
Number of banks	-0.002	0.018	0.039	-0.005	-0.029	-0.008	-0.055	1							
Collateral	-0.008	-0.012	0.043	0.099	0.140	0.186	-0.020	-0.093	1						
Age	0.042	-0.017	0.027	0.012	0.097	0.056	0.422	0.031	-0.002	1					
Labour Productivity	-0.022	0.058	-0.097	-0.079	0.025	0.028	0.028	0.128	-0.089	0.063	1				
Capital Intensity	-0.012	0.037	-0.048	-0.042	-0.020	0.022	-0.007	0.211	-0.012	0.016	0.424	1			
Family	-0.030	0.013	-0.059	-0.028	-0.066	-0.083	0.087	-0.082	0.071	-0.049	-0.116	-0.068	1		
Leverage	-0.015	0.013	0.039	0.029	0.011	0.067	-0.093	0.117	0.121	-0.094	-0.130	0.013	0.014	1	
Group	0.008	0.004	0.069	0.047	0.074	0.099	-0.072	0.059	-0.045	0.069	0.141	0.073	-0.572	-0.014	1
Number of employees	-0.024	0.007	-0.005	-0.007	0.027	0.042	-0.003	0.010	-0.042	0.005	-0.004	-0.002	-0.029	0.002	0.031

Note: This table reports the correlation matrix for the main variables used in the analysis.

Table 2A: Credit Relationships and Export Response to the Crisis. Baseline Estimates

	(1) Probit Drop Export	(2) Probit Drop Export	(3) Probit Drop Export	(4) Probit Drop Export	(5) Probit Drop Export	(6) Probit Drop Export	(7) OLS Change export	(8) OLS Change export	(9) OLS Change export	(10) OLS Change export	(11) OLS Change export	(12) OLS Change export
Interviews	-0.043***					-0.036***	0.026**					0.023*
	(0.014)					(0.014)	(0.008)					(0.010)
Business plan		-0.029***				-0.013*		0.013				0.001
		(0.010)				(0.008)		(0.013)				(0.015)
Relationship length			0.002***			0.002***			-0.001***			-0.001**
			(0.001)			(0.001)			(0.000)			(0.000)
Number of banks				-0.005***		-0.005***				0.003**		0.004
				(0.002)		(0.001)				(0.001)		(0.002)
Collateral					0.006						-0.013	
					(0.009)						(0.013)	
Age	0.000**	0.000**	0.000	0.001***	0.000**	0.000	-0.000	-0.000	-0.000	-0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.002	0.002	-0.002	0.003	0.001	0.007	0.005	0.006	0.007	0.004	0.005	0.001
	(0.007)	(0.007)	(0.006)	(0.007)	(0.008)	(0.007)	(0.004)	(0.004)	(0.005)	(0.002)	(0.005)	(0.007)
Labor Productivity	-0.016**	-0.015**	-0.015**	-0.022**	-0.017***	-0.014*	0.046***	0.046***	0.044***	0.045***	0.048**	0.043***
	(0.007)	(0.007)	(0.006)	(0.009)	(0.004)	(0.008)	(0.012)	(0.012)	(0.012)	(0.002)	(0.015)	(0.011)
Capital Intensity	-0.006	-0.007	-0.008	0.003	-0.007	-0.004	-0.004	-0.003	-0.003	-0.008	-0.003	-0.005
	(0.008)	(0.008)	(0.009)	(0.007)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)	(0.009)	(0.008)
Family	-0.040**	-0.039**	-0.039***	-0.031***	-0.039**	-0.041**	0.024	0.023	0.021	0.016	0.023	0.021
	(0.016)	(0.015)	(0.015)	(0.009)	(0.016)	(0.016)	(0.021)	(0.022)	(0.020)	(0.016)	(0.021)	(0.020)
Leverage	-0.080	-0.070	-0.069	-0.038	-0.090	-0.044	0.018	0.015	0.013	-0.008	0.029	-0.001
	(0.120)	(0.120)	(0.099)	(0.033)	(0.117)	(0.103)	(0.074)	(0.077)	(0.063)	(0.018)	(0.079)	(0.062)
Group	-0.020	-0.017	-0.012	-0.010	-0.019	-0.014	0.016	0.014	0.011	0.009	0.016	0.012
	(0.019)	(0.017)	(0.018)	(0.009)	(0.018)	(0.021)	(0.017)	(0.016)	(0.018)	(0.012)	(0.017)	(0.018)
+ Country dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
+ Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,844	2,846	2,799	4,901	2,841	2,790	2,847	2,849	2,802	4,901	2,844	2,793
Pseudo R-squared	0.0450	0.0432	0.0453	0.0335	0.0431	0.0502	0.049	0.048	0.048	0.037	0.048	0.051

Note: This table reports the effects of relationship and transactional lending on firms' export response to the crisis. Relationship lending is measured by: a binary variable for bank's access to interviews with the management of the firm (columns 1, 6, 7 and 12), the bank's access to the business plan and targets of the firm (columns 2, 6, 8 and 12), the length of the main credit relationship (columns 3, 6, 9 and 12) and (as an inverse measure of credit relationship intensity) the number of banks with which the firm has recently being doing business (columns 4, 6, 10 and 12). Transactional lending is measured by collateral (columns 5 and 11). The table reports the marginal effects (columns 1-6) or regression coefficients (columns 7-12) and, in parentheses, the associated standard errors (clustered by country). The dependent variables and the estimation method are reported at the top of each column. All the regressions include country and industry fixed effects. See Table 1 and Section 4 for details on the control variables. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 2B: Credit Relationships and Response to the Crisis. Baseline Estimates (cont.d)

	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit	(6) Probit	(7) Probit	(8) Probit	(9) Probit	(10) Probit	(11) Probit	(12) Probit
	Panel A: Export response, accounting for possible self-selection into the export market											
	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export	Drop Export
Interviews	-0.043***					-0.036***	-0.033**					-0.028**
	(0.014)					(0.014)	(0.014)					(0.014)
Business plan		-0.029***				-0.013*		-0.023**				-0.011
		(0.010)				(0.008)		(0.011)				(0.008)
Relationship length			0.002***			0.002***			0.002***			0.002***
			(0.001)			(0.001)			(0.000)			(0.000)
Number of banks				-0.005***		-0.005***				-0.003**		-0.004***
				(0.002)		(0.001)				(0.002)		(0.001)
Collateral					0.006						0.003	
					(0.009)						(0.009)	
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
+ Mills ratio	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Observations	2,844	2,846	2,799	4,901	2,841	2,790	2,825	2,827	2,783	4,865	2,822	2,774
R-squared	0.0450	0.0432	0.0453	0.0335	0.0431	0.0502	0.0458	0.0439	0.0466	0.0340	0.0441	0.0512
	Panel B: Response of domestic activities											
	Drop Workforce	Drop Workforce	Drop Workforce	Drop Workforce	Drop Workforce	Drop Workforce	Reduction investments	Reduction investments	Reduction investments	Reduction investments	Reduction investments	Reduction investments
Interviews	-0.005					-0.002	0.011					0.005
	(0.030)					(0.034)	(0.011)					(0.008)
Business plan		-0.004				-0.003		0.035***				0.039***
		(0.013)				(0.013)		(0.010)				(0.008)
Relationship length			-0.000			-0.000			0.001			0.001
			(0.001)			(0.001)			(0.001)			(0.001)
Number of banks				-0.000		0.001*				-0.006***		-0.009***
				(0.002)		(0.001)				(0.002)		(0.003)
Collateral					0.062***						0.107***	
					(0.020)						(0.022)	
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	4,740	4,741	4,664	8,439	4739	4,657	4,195	4,195	4,128	7,188	4195	4,125
R-squared	0.059	0.059	0.058	0.054	0.061	0.058	0.043	0.044	0.045	0.042	0.051	0.047

Note: This table reports the effects of relationship lending on the response to the crisis of export accounting for possible self-selection into the export market in 2008 (Panel A, columns 7-12). It also reports the effects of relationship lending on the response to the crisis of two indicators of domestic activities: the drop in the firm's workforce (Panel B, columns 1-6) and the reduction of its planned investments (Panel B, columns 7-12). Columns 1-6 in Panel A carry over the results for firms' export response from Table 2A. In columns 7-12 in Panel A, to account for possible selection, we use a Heckman sample selection model by adding an inverse Mills ratio to the baseline estimations. The inverse Mills ratio is estimated from a Probit of export participation decision in 2008 on the controls used in Table 2A and on a dummy variable indicating whether the firm has some executive that worked abroad in previous years. Relationship lending is measured by: a binary variable for bank's access to interviews with the firm's management, bank's access to the firm's business plan and targets, the length of the main credit relationship and (as an inverse measure) the number of banks with which the firm has being doing business. The table reports the marginal effects and, in parentheses, the associated standard errors (clustered by country). The dependent variables and the estimation method are at the top of each column. All the regressions include the control variables used in Table 2A. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 3: Credit Relationships and Export Response. Financial Dependence and Information Complexity

	Panel A: External financial dependence											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Probit	Probit	Probit	OLS	OLS	OLS	Probit	Probit	Probit	OLS	OLS	OLS
	Drop Export			Change export			Drop Export			Change export		
Interviews	-0.034***		-0.018	0.012		0.010						
	(0.010)		(0.024)	(0.015)		(0.015)						
Interview * External dep. dummy	-0.050			0.101*								
	(0.042)			(0.052)								
Interview * External dep. contin.		-0.013***			0.011***							
		(0.005)			(0.002)							
Interview * Rajan Zingales ind.			-0.072*			0.046**						
			(0.040)			(0.018)						
Business plan							-0.025***		-0.033*	-0.000		0.005
							(0.009)		(0.017)	(0.010)		(0.016)
Bus. plan * External dep. dummy							-0.017			0.098**		
							(0.013)			(0.029)		
Bus. plan * External dep. contin.								-0.008***			0.007	
								(0.003)			(0.003)	
Bus. plan * Rajan Zingales ind.									0.009			0.022
									(0.038)			(0.032)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,830	2,830	2,693	2,833	2,833	2,696	2,832	2,832	2,695	2,835	2,835	2,698
Pseudo R-squared	0.045	0.045	0.046	0.054	0.053	0.049	0.043	0.043	0.043	0.053	0.052	0.047

	Panel B: Product informational complexity				Panel C: Decentralization to managers of decisions and information							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Probit	Probit	OLS	OLS	Probit	Probit	OLS	OLS	Probit	Probit	OLS	OLS
	Drop Export		Change export		Drop Export		Change export		Drop Export		Change export	
Interviews	0.042		-0.050**		-0.024***	-0.031***	0.023***	0.008				
	(0.032)		(0.018)		(0.008)	(0.008)	(0.003)	(0.011)				
Interview * Nunn indicator	-0.158**		0.143***									
	(0.077)		(0.037)									
Interview * Decentralized					-0.046*		-0.018					
					(0.026)		(0.022)					
Interview * Decentralization shock						-0.080		0.107***				
						(0.058)		(0.020)				
Business plan		-0.084**		0.056					-0.017	-0.022*	0.000	0.005
		(0.033)		(0.046)					(0.014)	(0.012)	(0.012)	(0.011)
Bus. plan * Nunn indicator		0.107*		-0.082								
		(0.062)		(0.069)								
Interview * Decentralized									-0.036		0.035	
									(0.029)		(0.019)	
Interview * Decentralization shock										-0.072		0.060**
										(0.052)		(0.016)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,607	2,609	2,610	2,612	2,724	2,724	2,726	2,726	2,724	2,724	2,726	2,726
Pseudo R-squared	0.0469	0.0445	0.051	0.049	0.049	0.048	0.048	0.050	0.048	0.047	0.048	0.048

Note: This table reports the effects of relationship lending on firms' export response to the crisis according to firms' external financial dependence and informational complexity. Relationship lending is measured by a binary variable for the bank's access to interviews with the management of the firm and the bank's access to the business plan and targets of the firm. In Panel A, we interact our measures of relationship lending technology with measures of external financial dependence due to technological factors. Our first two measures of external financial dependence are constructed using a specific question in the survey. The third indicator of sectoral external financial dependence is borrowed from the analysis in Rajan and Zingales (1998). In Panel B, we interact our measures of relationship lending with a measure of product informational complexity borrowed from Nunn (2007). In Panel C, we interact our measures of relationship lending with a measure of decentralization of decisions and information to managers and with a measure of shocks that have recently induced decentralization of decisions and information to managers. The table reports the marginal effects or the regression coefficients and, in parentheses, the associated standard errors (clustered by country). The dependent variables and the estimation method are reported at the top of each column. All the regressions include the control variables used in Table 2A (see Table 1 and Section 4 for details). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 4: Credit Relationships and Export Response. Bank Characteristics

	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) OLS	(6) OLS	(7) OLS	(8) OLS
	Panel A: Foreign bank							
	Drop Export				Change Export			
Interviews	-0.036				0.019*			
	(0.024)				(0.009)			
Interv.* bank charact.	-0.044				0.046*			
	(0.064)				(0.020)			
Business_plan		-0.018				0.005		
		(0.014)				(0.014)		
Bus. plan * bank charact.		-0.069*				0.048**		
		(0.041)				(0.017)		
Relation. length			0.002**				-0.001***	
			(0.001)				(0.000)	
Relat. length * bank charact.			-0.000				0.001	
			(0.001)				(0.001)	
Number of banks				-0.004***				0.004*
				(0.001)				(0.002)
Numb. of banks * bank charact.				-0.001				-0.003
				(0.003)				(0.003)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,844	2,846	2,799	4,901	2,847	2,849	2,802	4,901
Pseudo R-sq	0.0470	0.0458	0.0466	0.0339	0.050	0.049	0.049	0.037
	Panel B: Domestic bank for foreign activities							
	Drop Export				Change Export			
Interviews	-0.078**				0.078***			
	(0.033)				(0.017)			
Interv.* bank charact.	0.039				-0.060*			
	(0.045)				(0.025)			
Business_plan		-0.094**				0.057**		
		(0.040)				(0.016)		
Bus. plan * bank charact.		0.072*				-0.050**		
		(0.043)				(0.014)		
Relation. length			0.004***				-0.001	
			(0.001)				(0.001)	
Relat. length * bank charact.			-0.003**				0.000	
			(0.001)				(0.001)	
Number of banks				-0.006***				0.003*
				(0.001)				(0.001)
Numb. of banks * bank charact.				0.002				0.001
				(0.002)				(0.002)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,844	2,846	2,799	4,901	2,847	2,849	2,802	4,901
Pseudo R-sq	0.0456	0.0444	0.0462	0.0335	0.050	0.048	0.048	0.037
	Panel C: Bank with an international network							
	Drop Export				Change Export			
Interviews	-0.035**				0.027**			
	(0.014)				(0.008)			
Interv.* bank charact.	-0.038**				-0.002			
	(0.015)				(0.014)			
Business_plan		-0.043**				0.019		
		(0.018)				(0.016)		
Bus. plan * bank charact.		0.044*				-0.025**		
		(0.027)				(0.007)		
Relation. length			0.002**				-0.001**	
			(0.001)				(0.000)	
Relat. length * bank charact.			-0.000				-0.001	
			(0.002)				(0.000)	
Number of banks				-0.009***				0.006**
				(0.002)				(0.002)
Numb. of banks * bank charact.				0.012**				-0.009***
				(0.005)				(0.002)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,806	2,806	2,758	2,802	2,809	2,809	2,761	2,805
Pseudo R-sq	0.0425	0.0415	0.0430	0.0433	0.049	0.048	0.049	0.050

Note: This table reports the effects of relationship lending interacted with the main bank characteristics on firms' export response to the crisis. Relationship lending is measured by a binary variable for the bank's access to interviews with the management of the firm and the bank's access to the business plan and targets of the firm. In Panel A, we interact our measures of relationship lending technology with a binary variable equal to one if the main bank is a foreign bank. In Panel B, we interact our measures of relationship lending with a binary variable equal to one if the main bank used for foreign activities is a domestic bank. In Panel C, we interact our measures of relationship lending with a binary variable equal to one if the main bank has an international network. The table reports the marginal effects or the regression coefficients and, in parentheses, the associated standard errors (clustered by country). The dependent variables and the estimation method are reported at the top of each column. All the regressions include the control variables used in Table 2A (see Table 1 and Section 4 for details). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 5: Credit Relationships and Export Response. Export Characteristics and Markets

	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) Probit	(10) Probit	(11) Probit	(12) Probit	(13) OLS
	Panel A: Regular exporter								Panel B: Export market				
									EU 15	Other European countries	China and India	Mono market	Mono market
	Drop Export				Change Export				Drop Export				Change Export
Interviews	-0.072***				0.070**				-0.041***	-0.030**	-0.032	-0.044***	0.016
	(0.022)				(0.025)				(0.009)	(0.015)	(0.025)	(0.009)	(0.009)
Interview *	0.039**				-0.059**				-0.000	-0.025**	-0.010	0.004	0.030*
export charact.	(0.016)				(0.023)				(0.029)	(0.012)	(0.071)	(0.030)	(0.012)
Business plan		-0.025				0.045							
		(0.036)				(0.045)							
Business plan *		-0.007				-0.043							
export charact.		(0.042)				(0.046)							
Relation. length			0.003***				-0.001						
			(0.001)				(0.001)						
Relation. length *			-0.001				-0.000						
export charact.			(0.001)				(0.001)						
Number of banks				-0.003**				0.007					
				(0.001)				(0.005)					
Number banks *				-0.003***				-0.005					
export charact.				(0.001)				(0.005)					
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,843	2,845	2,798	4,898	2,846	2,848	2,801	4,898	2,807	2,403	2,301	2,844	2,847
R-squared	0.0502	0.0477	0.0499	0.0385	0.051	0.049	0.049	0.039	0.0460	0.0502	0.0522	0.0450	0.051

Note: This table reports the effects of relationship lending interacted with export characteristics on firms' export response to the crisis. Relationship lending is measured by a binary variable for the bank's access to interviews with the management of the firm and the bank's access to the business plan and targets of the firm. In Panel A, we interact our measures of relationship lending technology with a binary variable equal to one if the firm is a regular exporter. In Panel B, we interact our measures of relationship lending with binary variables for different export markets. The table reports the marginal effects or the regression coefficients and, in parentheses, the associated standard errors (clustered by country). The dependent variables and the estimation method are reported at the top of each column. All the regressions include the control variables used in Table 2A (see Table 1 and Section 4 for details). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 6: Credit Relationships and Export Response. Firm Characteristics

	(1) Probit	(2) Probit	(3) Probit	(4) Probit	(5) Probit	(6) Probit	(7) Probit	(8) Probit
	Panel A: Age							
	Age < 27	Age > 27	Age < 27	Age > 27	Age < 27	Age > 27	Age < 27	Age > 27
	Drop export							
Interviews	-0.078***	-0.011						
	(0.025)	(0.009)						
Business plan			-0.047***	-0.016				
			(0.012)	(0.016)				
Relationship length					0.003***	0.001**		
					(0.000)	(0.001)		
Number of banks							-0.004***	-0.005**
							(0.001)	(0.002)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,379	1,459	1,379	1,461	1,361	1,432	2,312	2,585
Pseudo R-squared	0.042	0.062	0.037	0.061	0.037	0.066	0.027	0.044
	Panel B: Size							
	Sales < 10mil	Sales > 10mil	Sales < 10mil	Sales > 10mil	Sales < 10mil	Sales > 10mil	Sales < 10mil	Sales > 10mil
	Drop export							
Interviews	-0.054**	-0.031*						
	(0.027)	(0.018)						
Business plan			-0.032	-0.035				
			(0.020)	(0.027)				
Relationship length					0.003***	0.001		
					(0.000)	(0.001)		
Number of banks							-0.008***	-0.000
							(0.001)	(0.003)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,827	755	1,827	755	1,803	740	3,116	1,313
R-squared	0.045	0.045	0.042	0.046	0.047	0.045	0.035	0.037
	Panel C: Listed firms							
	Non-Listed	Listed	Non-Listed	Listed	Non-Listed	Listed	Non-Listed	Listed
	Drop export							
Interviews	-0.043***	-0.216						
	(0.015)	(0.192)						
Business plan			-0.030***	-0.396*				
			(0.009)	(0.221)				
Relationship length					0.002***	0.013		
					(0.000)	(0.015)		
Number of banks							-0.006***	0.006
							(0.002)	(0.008)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,794	39	2,796	39	2,756	34	4,769	118
Pseudo R-squared	0.044	0.263	0.043	0.292	0.044	0.251	0.033	0.218

Note: This table reports the effects of relationship lending interacted with firms' characteristics on firms' export response to the crisis. Relationship lending is measured by a binary variable for bank's access to interviews with the management of the firm and the bank's access to the business plan and targets of the firm. Panels A-C display regressions that allow the effect of relationship lending to differ across firms of different size, age and ownership structure. All the regressions are estimated by Probit model. The table reports the marginal effects and, in parentheses, the associated standard errors (clustered by country). The dependent variables and the estimation method are reported at the top of each column. All the regressions include the control variables used in Table 2A (see Table 1 and Section 4 for details). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.