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Abstract

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JEL Codes: G21, D82, F10

Keywords: Bank-Firm Relationships, Lending Technologies, Trade

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Abstract

Using a rich sample of small and medium-sized European manufacturers, we investigate the nexus between banks' relationship lending technologies and firms' export activities during the 2009 great trade collapse. We find that the contraction of firms' export was milder when banks had access to up-to-date "soft" information on firms' export prospects. However, we find no evidence of an association between the resilience of firms' export and banks' experience on firms' past activities. The nexus between export resilience and banks' access to soft information is especially tight for young and small exporters and for firms at an early stage of internationalization.

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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 22 percent implying a trade contraction even sharper than the epochal drop of 1930. Since the peak of the financial crisis preceded the abrupt trade contraction, it became natural to think of the link between financial factors and the trade collapse. Credit availability can be crucial for firms' export activities, which entail sizeable fixed costs (Manova, 2013; Das et al., 2007). Moreover, export is particularly vulnerable to financial imperfections generated by information asymmetries between firms and financiers. For instance, financiers may find it hard to obtain information on foreign markets of destination of export products.

While the link between the credit sector and firms' export activities has been increasingly documented in recent years (Manova, 2013; Minetti and Zhu, 2011; Greenaway et al., 2007; Paravisini et al., 2015), the role of banks' lending technologies remains a relatively unexplored aspect of this link. In banking the production of a significant amount of information is decentralized (Berger and Udell, 2006). Loan officers acquire "soft" (private,

non-codified) information through credit relationships with the firms they lend to, especially when “hard” (verifiable, codified) information on borrowers is scarce (Stein, 2002). Accounting for the role of credit relationships is then fundamental for understanding the transmission of financial shocks to export through the credit market. It is also critical for policymakers. In recent years, a debate has developed on the consequences that the progressive dilution of credit relationships may have for the transmission of financial shocks to the real sector (Kroznner, 2015). And it is increasingly argued that bank regulation and supervision can better moderate the impact of financial shocks if they take banks’ lending technologies into account (Ayadi et al., 2012).

The goal of this paper is to help fill this gap, investigating the nexus between the extent of trade impairment in 2009 – the time of most intense loan supply contraction – and banks’ lending technologies. To study the link between credit relationships and the trade collapse, we exploit granular information from a large survey, EFIGE, which targets manufacturing businesses in seven European countries (Austria, France, Germany, Hungary, Italy, Spain, and the United Kingdom). The data set provides rich information on firms’ export participation and foreign sales based directly on firms’ responses to survey questions. Most importantly for our purposes, it includes precise questions on the collapse of firms’ export in 2009.

Firms in the EFIGE survey also answer detailed questions about their access to bank credit and their relationships with banks. In particular, we can unbundle the multidimensional nature of credit relationships by distinguishing between the access of the main bank to up-to-date soft information about the firm’s export prospects and the bank’s previous experience with the firm. Among the indicators for access to soft information, we observe the bank’s access to interviews with the firm’s management and to the firm’s current business plan and targets. Among the indicators for previous experience with the firm, we observe 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 a strong negative association between banks’ access to soft information and the drop in firms’ export in 2009. Our estimates suggest that a firm whose main bank has access to interviews with the firm’s management is 4 percent less likely to experience an export drop compared to 2008 (a 5 percent lower unconditional probability of an export drop). Similarly, a firm whose main bank has access to information about the firm’s current business plan and targets is 3 percent less likely to experience an export contraction. However, the indicators of banks’ previous experience with borrowing firms appear to be positively associated with the drop in firms’ export. A possible interpretation is that, during the financial crisis, banks with access to soft information were better able to protect firms from the contraction of information-intensive activities such as export.

By contrast, a previous long experience with a firm might have induced banks to protect activities on which they had become more accustomed in the past, such as domestic activities, rather than export. The results for domestic activities are in line with this interpretation.

It is important to stress upfront that the paper cannot firmly establish a causal link from bank lending technologies to the resilience of firms' export during the crisis. We have relatively mild concerns about reverse causality in our setting: the financial crisis hit in an abrupt way at the end of 2008, while bank lending technologies constitute a slow-moving feature of the firm-bank links, as they are strongly driven by structural aspects such as the physical distance between bank and firm or the bank's organizational structure (Alessandrini et al., 2010).¹ However, omitted factors could drive both banks' lending technologies and the exposure of firms' export to shocks. In our setting, perhaps the most relevant concern regards the possible omission of factors related to the nature of the banks. For example, foreign banks might be exposed to negative shocks in foreign countries and hence be prompted to curtail credit to local exporters. They could also be less prone to adopting relationship lending technologies, given the distance between local loan officers and the top bank management in the foreign country of origin. This would imply a negative correlation between banks' access to soft information and firms' export drop. A similar concern could arise for large national banks, which might engage less in soft information acquisition, given their inherently hierarchical structure, and at the same time be differently exposed to shocks than local banks. To assuage these concerns, we saturate the empirical model with a full set of bank-ownership-size fixed effects, which differentiate not only between foreign and domestic banks but also, among domestic banks, between large banks with a national scope and smaller local banks. In addition, by hand-matching information from the firm-level Orbis database (Bureau Van Dijk) to our data set, we can construct an indicator for the country of origin of the main bank. In robustness tests, we then insert even finer fixed effects which distinguish among foreign banks based on their country of origin.

To further mitigate endogeneity concerns, in alternate tests we also employ the approach adopted by Manova (2013), and originally proposed by Rajan and Zingales (1998), to isolate the impact of financial factors on firms' export. In particular, we examine whether the nexus between relationship lending technologies and 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 additional tests we also investigate whether the nexus is tighter for more informationally opaque export products, as

¹When 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).

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 alternate estimation approaches.

In the second part of the paper we exploit details provided by the survey about the characteristics of exporters and of their export activity in order to gain more intuition about our findings. We document that for regular exporters there is a looser link between banks' access to soft information and the resilience of export during the crisis. More public knowledge is typically available about regular exporters so that the benefit of banks' access to soft information should be less pronounced than for occasional exporters. And analogous results emerge when we focus on the characteristics (e.g., geographic distance) of export markets, as we elaborate below. We then explore the role of firm attributes in the link between bank lending technologies and the export drop during the crisis. 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). This is again consistent with the above interpretation: banks' access to soft information can be especially valuable for informationally difficult exporters.

To summarize, our findings suggest that, during the financial crisis, exporters with tighter credit relationships exhibited a stronger resilience to the negative shock. However, the results also suggest that not necessarily all the dimensions of the multifaceted bank-firm relationships are equally related to the resilience of export. Banks' access to up-to-date, soft information about export prospects appears to be negatively associated to the drop in firms' export. However, banks' experience about previous activities of the firms exhibits a weaker and, if anything, positive link with the export drop during the crisis.

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. Section 7 concludes and draws policy implications. Details on additional robustness tests are relegated to the online Supplement.

2 Prior Literature

This paper relates to two strands of literature. The first strand studies the nexus between the credit market and export. Theoretical works underscore that export is particularly exposed to credit imperfections (Manova, 2013; Chaney, 2016). A firm has to devote time and pecuniary resources to identify an export market and make its products suitable to

that market.² Because most export costs have to be paid upfront, firms must have enough liquidity at hand. Greenaway et al. (2007) find an empirical link between firms' financial health and export participation. Minetti and Zhu (2011) use survey data from Italy and show that credit rationing reduces export. On firm-level data from China, Manova et al. (2015) uncover evidence that credit constraints hinder international trade.

Within this strand of literature on credit markets and export we contribute to two groups of recent studies. The first group looks at banks' role in firms' export. Paravisini et al. (2015) use data from Peruvian firms and show that a contraction of bank funding reduces export. Niepmann and Schmidt-Eisenlohr (2017) focus on banks' role in offering to exporters special trade finance products, such as letters of credit. The second group of studies document the link between financial crises and trade. Chor and Manova (2012) document a negative link between financial constraints and export during the recent financial crisis using U.S. aggregate/sectoral data. Coulibaly et al. (2011) disentangle the effect of falling demand from that of financial constraints on sales in six emerging economies in Asia. Abiad et al. (2014) bring support to the view that financial constraints mattered in the 2009 trade collapse by examining 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 (2017) find a relationship between bilateral trade links and lender-borrower characteristics in the great cross-border bank deleveraging. Motivated by the primary importance of bank-firm relationships in the credit sector, our analysis contributes to these studies by investigating the link between relationship lending technologies and firms' export activities during crises. Our micro-level survey data are uniquely suited for this purpose as they allow to unbundle and measure precisely the different dimensions of credit relationships.³ This may help scholars understand the consequences of changes in the strength of credit relationships for the transmission of crises to the export sector. It can also offer insights into regulatory reforms that encompass a stronger emphasis on bank business models and lending technologies.

The paper also relates to the growing literature on the role of bank lending technologies in firms' investment decisions (Alessandrini et al., 2010; Degryse et al., 2009b; Sette and Gobbi, 2015; Herrera and Minetti, 2007). Ferri et al. (2001) document that for Korean firms with stronger credit relationships outstanding loans plunged less during the 1997 Korean financial crisis. Sette and Gobbi (2015) find that in Italy, following the

²These 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).

³Minetti and Zhu (2011) and De Bonis et al. (2015) find suggestive evidence that the duration of credit relationships does not affect the probability of exporting. 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.

Lehman default shock, the growth of credit was higher, and its cost lower, when bank-firm relationships were stronger. Beck et al. (2018) show that relationship lending alleviates credit constraints during a cyclical downturn, especially for small and informationally opaque firms. Thus far, there is scant evidence on the link between relationship lending technologies and export, and even less so in the context of financial crises.

3 Testable Hypotheses

Berger and Udell (2006) define a lending technology as a unique combination of primary information source, screening and underwriting policies/procedures, loan contract structure, and monitoring strategies/mechanisms. While transactional lending technologies are based on hard information (such as that derived from collateral guarantees), relationship lending technologies hinge on banks' collection of soft information through personal interactions between loan officers and firm managers and access to detailed documents of the firms (Stein 2002; Berger and Udell 2002). Berger and Udell (2006) and Uchida et al. (2012) stress that transactional and relationship lending technologies constitute broad categories and that one should account for their multidimensional nature, obtaining precise measures of the mechanisms through which information is produced (e.g., methods of contact and communication, frequency of meetings, role of past experience vs. access to new information). In particular, one can distinguish two key dimensions within relationship lending technologies. There is a time/experience dimension: loan officers accumulate experience about a firm over time through repeated interactions with the firm (Berger et al., 2005; Liberti and Mian, 2009). Loan officers, however, also acquire new, up-to-date soft information through interviews with the firm's managers and access to the current business plan and targets of the firm (Berger and Udell, 2006).⁴

Based on these two dimensions of relationship lending, we envisage two mechanisms that can link credit relationships with the response of export during a crisis. On the one hand, the access to up-to-date soft information can enable a bank to better assess the prospects of export activities and thus better protect an exporter. This hypothesis draws on the above-mentioned literature underscoring the potential buffer role of credit relationships in difficult times (Boot, 2000; Degryse et al., 2009a; Alessandrini et al., 2009). On the other hand, we also envisage a possible negative link between credit relationships and the resilience of export during a crisis. The previous experience of a bank with a firm could lead the bank to especially protect activities on which it has stronger 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

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

support domestic investments more than risky export activities in foreign markets. These arguments lead to our first main hypothesis.

Hypothesis 1. The link between credit relationships and firms’ export during a financial crisis is ambiguous a priori. The export drop can be smaller when banks have access to soft information on firms. However, it can be larger when banks have the incentive to especially protect domestic activities on which they have accumulated stronger experience.

The richness of our database allows us to construct different measures of relationship lending technologies. In particular, 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 different channels in the link between relationship lending and firms’ export is to consider characteristics of the firm and its export activity. 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 it can also be more relevant in the case of small businesses for which information is traditionally scarce (Berger and Udell, 2006). This leads to a second set of testable hypotheses.

Hypothesis 2. A negative link between credit relationships and firms’ export drop during a crisis is more likely 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 hypotheses using comprehensive data from European firms and their credit relationships.

4 Data and Methodology

4.1 Empirical methodology and data description

We investigate the nexus between credit relationships and firms’ export during the first wave of the global financial crisis. The probability that the export of firm i drops during 2009 can be written as

$$P(\text{Drop}_{\text{export}} = 1 | R_i, Z_i) = \Phi(\alpha_1 + R_i\beta_1 + Z_i\gamma_1), \quad (1)$$

where $\Phi(\cdot)$ 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.

We use the following specification for the change in export sales

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

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 statistical representativeness, the data set was designed to fulfill two main criteria. First, the availability of an adequately large target sample of firms: 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 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. The survey questionnaire focuses on six broad areas of the surveyed firms: a) exports, imports, and internationalization; b) firm-bank relationships; c) ownership structure; d) workforce; e) investment, technological innovation, R&D; f) market structure and competition. Importantly, the survey also includes specific questions on firms' behavior during the crisis.⁵

Table 1 gathers descriptive statistics; Table 2 displays pairwise correlations among selected dependent and independent variables used in the analysis.⁶ At the mean, the 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.

⁵As the survey was 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.

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

4.2 Measurement

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 1). Using this information, we construct a dummy variable *Drop_export* equal to one if the firm experiences a reduction in the value of its exports in 2009, zero otherwise. 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.

We capture banks’ 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?*”.⁷ 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 bank’s access to up-to-date soft information about the firm and its export: 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 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 1). We also observe two indicators of the past experience of the bank with the firm, the length of the main credit relationship and the number of banks with which the firm has been doing business in the recent past. Petersen and Rajan (1994) show that the length of the credit relationship is a suitable measure of the experience garnered by the main bank; multiple credit relationships can instead 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. Table 2 reports a slight positive correlation between the indicator for the main bank’s access to interviews with managers and the length of the main credit relationship; the correlation between the indicator for the main bank’s access to the business plan and the length of the main credit relationship is slightly negative.

⁷Previous 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.

⁸Although 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-Camus and Godlewski, 2005).

Finally, we 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 (Berger and Udell, 2006). For 55 percent of the firms, the main bank also employs information on the firm’s collateral.

In the regressions we control for a rich set of factors that could shape the export response 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 (value added per worker) and firm size (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 (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 insert a dummy variable equal to one if the firm is a family business, zero otherwise. We also saturate the empirical model with a comprehensive array of fixed effects: sector dummies according to the two-digit NACE classification and country dummies based on the country in which the firm is located. As discussed below, we further insert fine bank-ownership-size fixed effects, capturing the nature of the main bank (whether it is a foreign bank, a domestic bank with a national scope, or a domestic bank with a local scope).

4.3 Endogeneity issues

The goal of the paper is to take a step towards isolating a nexus between credit relationships and the resilience of firms’ export. Establishing a causal link from bank lending technologies to the export response during the crisis is however beyond the scope of this analysis. As noted, we have relatively mild concerns about reverse causality in our setting, given the unexpected nature of the crisis shock at the end of 2008 and the slow-moving nature of bank lending technologies. Nonetheless, in spite of the inclusion of a rich set of controls, omitted factors may jointly drive bank lending technologies and firms’ export response. For example, during the crisis foreign banks may be exposed to foreign shocks and hence cut credit to exporters. Foreign banks could also be less inclined to adopting relationship lending technologies, given the distance between local loan officers and the top management located in the foreign country. This could imply a negative correlation between banks’ access to soft information and firms’ export contraction. A similar argument can be put forth for large national banks, which may engage less in relationship lending and soft information acquisition, given their hierarchical structure, and be differently exposed to shocks than local banks during the crisis. In the regressions, to account for these possible confounding effects, we insert a full set of bank-ownership-size fixed effects which allow us to compare lending technologies within foreign banks, domestic banks with a local scope, and domestic banks with a national scope. In further tests,

presented in the Supplement to conserve space, we include even finer sets of fixed effects. In particular, within the category of domestic banks with a national scope, we differentiate between banks with and without an international network of branches. Additionally, by hand-matching information from the firm-level Orbis database of Bureau Van Dijk to our data set, we construct finer fixed effects which distinguish among foreign banks based on the country of origin of the main bank.⁹ And, in further tests, we also include additional fixed effects capturing the broad area of export destination interacted with the industry to which the firm belongs. The results obtained using these alternate specifications with even finer fixed effects are virtually identical to those obtained with our main specification.

To further assuage endogeneity concerns, we complement our estimates with the approach proposed by Rajan and Zingales (1998) and adopted by Manova (2013) to help identify the impact of financial factors on firms’ export. This consists of testing whether the impact of banks’ lending technologies differs across firms with different external financial dependence for technological reasons. As highlighted by Manova (2013) for exports, in certain sectors firms need more external funding and have to sustain larger up-front costs for reasons solely related to the production process. Being driven by technological factors, external financial dependence is unlikely to be endogenous to the financial frictions faced by the firms. A first measure of external financial dependence is based on a question in the survey that asks the firms whether they are highly dependent on external finance for technological reasons. The second measure is 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 reflect the technological features of the production process (while financial dependence does not vary substantially across firms within an industry).¹⁰

In other tests we also exploit exogenous variation in the informational complexity of products and businesses. We expect the link between banks’ access to soft information

⁹We employ the variable “banker”, available from Orbis through Kompass, which shows the name of the banks with which the firm has a credit relationship. Following Giannetti and Ongena (2012) and Kalemli-Ozcan et al. (2018), we match bank names to the BvD ID numbers of banks and we next match these bank names with the bank’s country of origin. Through this procedure, we construct dummies for Germany, France, Italy, UK, USA, Spain, and other nationalities. If a firm reports more than one bank, we consider each bank. Finally, we interact these dummies with the dummy foreign main bank. A limit of this approach is that the information on banks in Orbis is based on the year 2016.

¹⁰The United States feature an advanced financial system and, in addition, the Compustat firms considered by Rajan and Zingales (1998) 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 external financial dependence do not reflect the intensity of financial frictions.

and export to be more pronounced for export products that are more informationally opaque. Thus, we also present estimates obtained by interacting our measures of bank lending technologies with the indicator of product information complexity in Nunn (2007). This is based on the extent to which products in a sector are traded in a market with many alternative buyers and sellers. Information on products that are traded in a thick market is generally deeper than for highly specific products. Following Nunn (2007), we construct a dummy that takes the value of one if the product is informationally complex, zero otherwise.

Finally, in other tests, we exploit information in the survey on (shocks to) the organizational structure of the firm and the decentralization of information to managers. These can affect the transmission of soft information from managers to loan officers. We return to this below.

5 Baseline Results

Table 2 shows that the drop in firms' export in 2009 exhibits a mild negative correlation with the indicators for banks' access to soft information (access to interviews with the firm's management and access to the firm's current business plan and targets) and a mild positive correlation with the main relationship length. In Table 3, we present the estimation results for 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 (columns 1-2 and 6). This suggests that the negative response of export to the external shock is less pronounced when banks have better access to soft information about a borrowing firm. The estimates imply that when 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 lower unconditional probability of an export drop. And the probability of an export contraction is 3 percentage points lower when the bank has access to the firm's business plan. Similar results emerge for the change in the value of exports (columns 7-8 and 12): for instance, the estimates suggest that the drop in export values is 2.6 percent smaller when the main bank has access to interviews with the firm's management. On the other hand, the association between the export drop and the indicators of the bank's past experience with the firm turns out to be opposite (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 export reduction during the crisis, and the same holds for firms with a less fragmented structure of credit relationships

(a smaller number of banks).¹¹

As pointed out by previous studies that investigate the link between financial factors and 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, displayed in Table 4, Panel A (columns 7-12), are virtually identical to those presented in Table 3 (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 analogous results.

To further grasp the mechanisms at work, we can compare our results with the link between relationship lending and domestic activities. In Table 4, Panel B, we test how measures of relationship lending relate to domestic activities, namely the drop in the firm's workforce and the reduction of the firm's planned investments during the crisis. The results differ remarkably from those obtained for export. Banks' access to soft information turns out to have no clear association with domestic activities (columns 1-12). If anything, access to the firm's business plan correlates positively with the probability that a firm reduces its domestic investments (column 12).

Overall, the baseline estimates yield intriguing insights. The negative response of export to the crisis appears to be smaller when banks have access to soft information about the firms' export prospects. However, the negative response of export appears to be larger when banks have a stronger previous experience with the firm.

As for the various controls included in the regressions, the signs of the estimated coefficients are in line with expectations (see Table 3). We find that older firms are more likely to experience a drop in export, while the negative response of export to the

¹¹The results do not reveal an association between firms' export drop and the proxy for transactional lending technology, the reliance of the main bank on collateral (see columns 5 and 12).

external shock is less pronounced for family firms and more productive businesses. Size, leverage, capital intensity, and group affiliation appear to have no clear association with the contraction of export during the crisis.

5.1 Financial dependence and informational complexity

We complement our baseline estimates with the approach in Manova (2013) and Rajan and Zingales (1998).¹² In the alternate tests of Table 5, Panel A, we interact the measures of relationship lending technology with measures of external financial dependence driven by technological factors. Our first measure of external financial dependence is a dummy constructed using a survey question that asks the firms whether they are highly dependent on external financing for reasons related to the production process.¹³ The second measure is from Rajan and Zingales (1998). The results in Panel A reveal that the negative link between banks' access to soft information and firms' export drop is significantly more pronounced for firms with higher external financial dependence.

In Table 5, Panels B-C, we exploit variation in the informational complexity of products and businesses. Nunn (2007) employs data from the U.S. input-output tables and measures the information specificity of a traded good with the proportion of its inputs that are highly specific (i.e., that are not sold on an organized exchange). The results in Panel B of Table 5 suggest a stronger negative link between banks' soft information and firms' export drop for more informationally complex goods (for which information on export prospects is probably more valuable). In Panel C we exploit variation in the informational complexity of businesses. The survey asks each firm whether the control of decisions and information is in the hands of the owner or information is decentralized to managers. It also asks whether in recent years the control of decisions and information has been subject to shocks that have led to a decentralization towards managers. In Panel C, we uncover some evidence of a stronger negative link between banks' access to soft information and firms' export drop for firms where information and decision making are (or have become) more decentralized towards managers. These are indeed contexts in which we expect the transmission of soft information between managers and loan officers to be easier.

¹²Manova (2013) finds that liquidity constraints depress firms' export especially in industries with high external financial dependence.

¹³The 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.

6 Disentangling the Channels

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

6.1 Export characteristics and markets

Table 6, Panel A, investigates the role of export characteristics. Regular exporters are likely to have higher informational transparency, due to more public knowledge about their foreign activities. For regular exporters the nexus between banks' soft information and the resilience of export could then be diluted. Based on a 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 6, columns 1 and 5, we estimate, respectively, a positive and a negative coefficient on the interaction between the indicator for banks' access to interviews with the firm's management and the dummy for regular exporter: the link between banks' soft information and the export drop is thus weaker for 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. 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 6, 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 negative link between banks' access to soft information and firms' export drop to be more pronounced for closer export markets, for which soft information is probably easier to decipher. 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 takes time for a firm to expand into a new market, firms that serve multiple markets are more likely to be established exporters (Eaton et al., 2008). Multiple markets exporters may also better diversify demand risk. Moreover, we expect the cost of entering additional foreign markets to be lower than the fixed cost of beginning an export activity.¹⁴ 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

¹⁴The knowledge gained in the first export market may be applied to other markets. Moreover, firms may not need to further adjust their production line and organization when entering additional markets. Overall, this may reduce the fixed costs for entry into additional export markets (Minetti and Zhu, 2011).

stronger link between banks' access to soft information and export for firms that serve a single foreign market than for multiple markets exporters (Panel B, column 13).

6.2 Firm attributes

In Table 7, we aim at gaining additional insights into the mechanisms driving our main results by focusing on the attributes of exporting firms. We study whether the nexus between banks' soft information and export resilience is tighter for exporters with more severe informational opacity. We capture 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.

Table 7 reports the results for the probability of export drop on subsamples based on firm age, size, and ownership structure. We uncover a stronger link between the resilience of export and the measures of banks' access to soft information for small and young firms than for bigger and older firms. For example, as shown in the regressions 1-4 of Panel A for export drop, while for young firms (below the median age) the estimated coefficient is negative and statistically significant on both the indicators of access to soft information (interviews with managers and information on the business plan), for older businesses the estimated coefficients are statistically insignificant. Analogously, the results in Panel B of Table 7 show that the coefficients on the indicators for banks' access to soft information are significant for small firms (less than 10 million sales) but not for larger firms. Thus, the nexus between relationship lending and 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 of Table 7, 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 evidence of a stronger association between banks' access to soft information and the resilience of firms' export for privately held firms than for publicly listed ones.¹⁵

¹⁵The corporate governance literature points out that family businesses are often informationally opaque (Bianco et al., 2013). For example, Cucculelli et al. (2018) 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 link between the export drop and (the proxies for) access to soft information for family firms.

7 Conclusion

In this paper we have investigated the nexus between credit relationships and firms' export during the 2009 credit crunch. In a large sample of European manufacturers, we have found that the probability of firms suffering an export drop in 2009 was lower when their banks had access to soft information about export prospects. However, we have not uncovered evidence of a nexus between the resilience of firms' export and banks' previous experience with firms' activities (if anything, export resilience appears to be negatively associated with banks' experience). We have further found that the nexus between banks' access to soft information and export resilience was tighter for informationally opaque firms, such as young and small businesses, and firms with an opaque governance structure, such as privately held firms. Further, it especially manifested itself in the case of sporadic exporters or exporters with scarce experience of foreign markets (e.g., operating in a single foreign market).

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 when their main bank adopted relationship lending technologies. However, the results also offer a nuanced perspective on the link between credit relationships and export. The resilience of export appears to be stronger when credit relationships ease the acquisition of banks' information about the prospects of export. The resilience of export appears instead to be lower when credit relationships materialize in banks' accumulation of experience with firms' domestic 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. Following an external shock, banks' ability to ascertain borrowers' risk class – owing to access to soft information – can attenuate the shock transmission 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 may create positive spillovers and limit the accumulation of macroeconomic risk. But the mechanistic method of the risk weighted asset approach (e.g., Basel 2 and 3) seems unable to account for such possible benefits created by relational banks. Therefore, banking regulation and supervision 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.
- 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.
- 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. (2002). Small business credit availability and relationship lending: The importance of bank organisational structure. *The Economic Journal*, 112(477), F32-F53.
- Berger, A.N., Udell, G.F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking and Finance* 30, 2945–2968.
- 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.

- Cerutti, E., Claessens, S. (2017). The great cross-border bank deleveraging: supply constraints and intra-group frictions. *Review of Finance* 21, 201–236.
- 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.
- 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. (2018). Relational capital in lending relationships: Evidence from European family firms. *Small Business Economics*, forthcoming.
- 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., 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.
- 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 Economía Working Paper no. 522, Banco de la Republica de Colombia.
- 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.
- Giannetti, M., Ongena, S. (2012). “Lending by example”: Direct and indirect effects of foreign banks in emerging markets. *Journal of International Economics*, 86, 167–180.
- 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.
- Herrera, A. M., Minetti, R. (2007). Informed finance and technological change: Evidence from credit relationships. *Journal of Financial Economics* 83, 223–269.
- Kalemli-Ozcan, S., Laeven, L., Moreno, D. (2018). Debt overhang, rollover risk, and corporate investment: Evidence from the European crisis. NBER working paper No. 24555. National Bureau of Economic Research.
- 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.
- Krozner, R. (2015). The future of banks: Will commercial banks remain central to the financial system? Prepared for the Federal Reserve Bank of Atlanta conference “Central Banking in the Shadows: Monetary Policy and Financial Stability Postcrisis”.
- 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., Zhu, S. (2011). Credit constraints and firm export: Microeconomic evidence from Italy. *Journal of International Economics* 83, 109–125.
- Niepmann, F., Schmidt-Eisenlohr, T. (2017). International trade, risk and the role of banks. *Journal of International Economics*, 107, 111–126.
- 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., and Yamori, N. (2012). Loan officers and relationship lending to SMEs. *Journal of Financial Intermediation* 21, 97–122.

Table 1: Summary Statistics

	Num.	Mean	Std. Dev.	Description
<i>Main dependent variables</i>				
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.
<i>Lending technologies</i>				
Interviews	6864	0.560	0.496	Dummy that takes the value of one if the bank can rely on interviews with the 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.
<i>Control variables</i>				
Age	12467	32.570	28.348	Number of years since inception
Number of employees	12501	254.98	10233	Total number of employees in the year of the survey
Labor 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.
Foreign bank	12476	0.076	0.266	Dummy that takes the value of one if the firm's main bank is a foreign bank.
Domestic local bank	12501	0.588	0.492	Dummy that takes the value of one if the firm's main bank is a domestic local bank.
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 variables used in the analysis.

Table 2: Correlation matrix

	Drop export	Change export	Drop workforce	Reduct. investm.	Interviews	Business plan	Relat. length	Number of banks	Collateral	Age	Labour product.	Capital intensity	Family	Leverage	Group	Numb. empl.	Foreign bank
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	0.03	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	1	
Foreign bank	-0.010	0.004	0.024	0.021	0.063	0.044	-0.050	0.105	-0.011	0.056	0.075	0.011	-0.159	-0.007	0.188	0.008	1

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

Table 3: Credit Relationships and Export Response to the Crisis. Baseline Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Probit	Probit	Probit	Probit	Probit	Probit	OLS	OLS	OLS	OLS	OLS	OLS
	Drop	Drop	Drop	Drop	Drop	Drop	Change	Change	Change	Change	Change	Change
	Export	Export	Export	Export	Export	Export	Export	Export	Export	Export	Export	Export
Interviews	-0.042*** (0.014)					-0.036*** (0.013)	0.026** (0.008)					0.023* (0.010)
Business plan		-0.028*** (0.010)				-0.013* (0.007)		0.013 (0.014)				0.001 (0.016)
Relationship length			0.002*** (0.001)			0.002*** (0.001)			-0.001*** (0.000)			-0.001*** (0.000)
Number of banks				-0.005*** (0.002)		-0.005*** (0.001)				0.003*** (0.001)		0.004 (0.002)
Collateral					0.006 (0.009)						-0.013 (0.013)	
Age	0.001** (0.000)	0.000** (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)
Size	0.003 (0.008)	0.002 (0.008)	-0.002 (0.006)	0.003 (0.006)	0.002 (0.008)	0.006 (0.007)	0.004 (0.004)	0.005 (0.004)	0.006 (0.005)	0.004 (0.002)	0.004 (0.004)	0.001 (0.006)
Labor productivity	-0.015** (0.007)	-0.015** (0.007)	-0.014** (0.006)	-0.022** (0.009)	-0.016*** (0.004)	-0.014* (0.008)	0.046*** (0.011)	0.045*** (0.011)	0.044*** (0.011)	0.045*** (0.002)	0.047** (0.014)	0.043*** (0.010)
Capital intensity	-0.006 (0.008)	-0.007 (0.008)	-0.008 (0.009)	0.003 (0.007)	-0.007 (0.009)	-0.004 (0.008)	-0.004 (0.009)	-0.003 (0.008)	-0.003 (0.008)	-0.008 (0.007)	-0.003 (0.009)	-0.005 (0.008)
Family	-0.040** (0.016)	-0.039** (0.015)	-0.039** (0.015)	-0.031*** (0.009)	-0.039** (0.016)	-0.040** (0.016)	0.024 (0.021)	0.023 (0.022)	0.021 (0.020)	0.017 (0.016)	0.023 (0.021)	0.022 (0.020)
Leverage	-0.075 (0.122)	-0.065 (0.122)	-0.065 (0.101)	-0.037 (0.033)	-0.084 (0.119)	-0.043 (0.104)	0.017 (0.074)	0.014 (0.077)	0.012 (0.062)	-0.007 (0.017)	0.028 (0.080)	0.000 (0.061)
Group	-0.020 (0.018)	-0.017 (0.017)	-0.012 (0.018)	-0.009 (0.010)	-0.019 (0.018)	-0.014 (0.021)	0.015 (0.017)	0.014 (0.016)	0.011 (0.018)	0.009 (0.012)	0.015 (0.017)	0.012 (0.018)
Domestic local bank	-0.013 (0.008)	-0.013 (0.009)	-0.012 (0.010)	-0.002 (0.004)	-0.017* (0.010)	-0.004 (0.009)	-0.001 (0.014)	-0.000 (0.014)	-0.001 (0.014)	-0.008 (0.008)	0.001 (0.013)	-0.006 (0.012)
Foreign bank	-0.013 (0.027)	-0.012 (0.027)	-0.008 (0.026)	-0.006 (0.016)	-0.010 (0.026)	0.003 (0.025)	0.019 (0.025)	0.018 (0.025)	0.018 (0.026)	-0.001 (0.010)	0.017 (0.025)	0.012 (0.028)
+ 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	0.0453	0.0435	0.0455	0.0335	0.0436	0.0502	0.049	0.048	0.049	0.037	0.049	0.051

Note: This table reports regressions for firms' export response to the crisis on the measures of relationship and transactional lending and on controls. 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 been 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, industry, and bank-ownership-size 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 4: Credit Relationships and Response of Firms' Activities to the Crisis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit
Panel A: Export response accounting for self-selection into export												
	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	-0.042*** (0.014)					-0.036*** (0.013)	-0.031** (0.014)					-0.027* (0.014)
Business plan		-0.028*** (0.010)				-0.013* (0.007)		-0.022** (0.010)				-0.011 (0.008)
Relationship length			0.002*** (0.001)			0.002*** (0.001)			0.002*** (0.000)			0.002*** (0.001)
Number of banks				-0.005*** (0.002)		-0.005*** (0.001)				-0.003* (0.002)		-0.004*** (0.001)
Collateral					0.006 (0.009)						0.003 (0.010)	
+ 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	0.0453	0.0435	0.0455	0.0335	0.0436	0.0502	0.0462	0.0443	0.0469	0.0341	0.0446	0.0513
Panel B: Response of domestic activities												
	Drop Workforce	Drop Workforce	Drop Workforce	Drop Workforce	Drop Workforce	Drop Workforce	Reduction Investments					
Interviews	-0.005 (0.031)					-0.003 (0.035)	0.011 (0.010)					0.005 (0.008)
Business plan		-0.004 (0.013)				-0.003 (0.012)		0.034*** (0.010)				0.038*** (0.007)
Relationship length			-0.000 (0.001)			-0.000 (0.001)			0.001 (0.001)			0.001 (0.001)
Number of banks				-0.001 (0.002)		0.001 (0.001)				-0.006** (0.002)		-0.009*** (0.003)
Collateral					0.062*** (0.020)						0.107*** (0.022)	
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	4,733	4,734	4,658	8,432	4739	4,651	4,195	4,195	4,128	7,188	4195	4,125
R-squared	0.059	0.059	0.058	0.055	0.061	0.058	0.044	0.044	0.045	0.043	0.051	0.047

Note: This table reports regressions for the response of firms' activities to the crisis on the measures of relationship and transactional lending and on controls. In Panel A, to deal with possible self-selection into export, we use a Heckman type sample selection model by adding an inverse Mills ratio to the baseline estimations (columns 7-12). The inverse Mills ratio is estimated from a Probit model of export participation decision in 2008 on the controls discussed in Section 4, which include a dummy variable indicating whether the firm has some executives who worked abroad in past years. Panel A also carries over the baseline results from Table 3 (columns 1-6). Panel B reports regressions for the response to the crisis of two indicators of domestic activities: the drop in the firm's workforce (columns 1-6) and the reduction of the firm's planned investments (columns 7-12). Relationship lending is measured by: a binary variable for bank's access to interviews with the management of the firm, the bank's access to the business plan and targets of the firm, 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. 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 3 (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. Financial Dependence and Information Complexity

	Panel A: External financial dependence											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Probit	Probit Drop Export	Probit	OLS	OLS Change Export	OLS	Probit	Probit Drop Export	Probit	OLS	OLS Change Export	OLS
Interviews	-0.034*** (0.010)		-0.017 (0.028)	0.012 (0.015)		0.009 (0.016)						
Interviews * External dep. dummy	-0.050 (0.041)			0.103* (0.052)								
Interviews * External dep. contin.		-0.013*** (0.004)			0.011*** (0.002)							
Interviews * Rajan Zingales ind.			-0.076 (0.047)			0.049* (0.021)						
Business plan							-0.024*** (0.009)		-0.033 (0.022)	-0.000 (0.011)		0.004 (0.017)
Bus. plan * External dep. dummy							-0.015 (0.013)			0.098** (0.030)		
Bus. plan * External dep. contin.								-0.008*** (0.003)			0.007 (0.004)	
Bus. plan * Rajan Zingales ind.									0.006 (0.045)			0.029 (0.031)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,830	2,830	2,736	2,833	2,833	2,739	2,832	2,832	2,738	2,835	2,835	2,741
Pseudo R-squared	0.045	0.045	0.047	0.055	0.054	0.050	0.043	0.044	0.044	0.053	0.052	0.049
	Panel B: Product informational complexity				Panel C: Decentralization of strategic decisions							
	(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 (0.032)		-0.050** (0.018)		-0.024*** (0.008)	-0.031*** (0.008)	0.023*** (0.003)	0.008 (0.011)				
Interviews * Nunn indicator	-0.158** (0.077)		0.143*** (0.037)									
Interviews * Decentralized					-0.046* (0.026)		-0.018 (0.022)					
Interviews * Change organization strategic decisions 2009						-0.080 (0.058)		0.107*** (0.020)				
Business plan		-0.084** (0.033)		0.056 (0.046)					-0.017 (0.014)	-0.022* (0.012)	0.000 (0.012)	0.005 (0.011)
Bus. plan * Nunn indicator		0.107* (0.062)		-0.082 (0.069)								
Interview * Decentralized									-0.036 (0.029)		0.035 (0.019)	
Interview * Change organization strategic decisions 2009										-0.072 (0.052)		0.060** (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	0.048	0.045	0.052	0.050	0.049	0.049	0.049	0.051	0.048	0.048	0.050	0.049

Note: This table reports regressions for firms' export response to the crisis on the measures of relationship and transactional lending according to firms' external financial dependence and product 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. 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 informational complexity borrowed from Nunn (2007). 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 3 (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. Export Characteristics and Markets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Probit	Probit	Probit	Probit	OLS	OLS	OLS	OLS	Probit	Probit	Probit	Probit	OLS
	Panel A: Regular exporter								Panel B: Export market				
	Drop Export				Change Export				EU 15	Other European countries	China and India	Mono market	Mono market
	Drop Export				Change Export				Drop Export				
	Drop Export				Change Export				Drop Export				
	Drop Export				Change Export				Drop Export				
Interviews	-0.071*** (0.022)				0.070** (0.026)				-0.040*** (0.009)	-0.030** (0.015)	-0.032 (0.026)	-0.043*** (0.009)	0.016 (0.010)
Interviews * export charact.	0.038** (0.016)				-0.059** (0.023)				-0.001 (0.031)	-0.026** (0.012)	-0.011 (0.071)	0.004 (0.031)	0.029* (0.013)
Business plan		-0.025 (0.036)				0.045 (0.045)							
Business plan * export charact.		-0.006 (0.042)				-0.043 (0.046)							
Relation. length			0.003*** (0.001)				-0.001 (0.001)						
Relation. length * export charact.			-0.001 (0.001)				-0.000 (0.001)						
Number of banks				-0.003* (0.001)				0.007 (0.005)					
Number banks * export charact.				-0.003*** (0.001)				-0.005 (0.004)					
+ 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	0.051	0.048	0.050	0.039	0.051	0.049	0.049	0.039	0.045	0.050	0.053	0.045	0.051

Note: This table reports regressions for firms' export response to the crisis on the measures of relationship lending interacted with export characteristics. 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 3 (see Table 1 and Section 4 for details). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 7: 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*** (0.025)	-0.010 (0.009)						
Business plan			-0.046*** (0.012)	-0.016 (0.015)				
Relationship length					0.003*** (0.000)	0.001* (0.001)		
Number of banks							-0.004*** (0.001)	-0.005** (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	0.043	0.063	0.038	0.062	0.038	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** (0.026)	-0.034* (0.019)						
Business plan			-0.032* (0.019)	-0.041 (0.026)				
Relationship length					0.003*** (0.000)	0.001 (0.001)		
Number of banks							-0.008*** (0.001)	-0.001 (0.002)
+ 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	0.051	0.043	0.052	0.048	0.050	0.036	0.038
Panel C: Listed firms								
	Non-Listed	Listed	Non-Listed	Listed	Non-Listed	Listed	Non-Listed	Listed
Drop export								
Interviews	-0.042*** (0.015)	-0.198 (0.147)						
Business plan			-0.029*** (0.008)	-0.378** (0.157)				
Relationship length					0.002*** (0.000)	0.024*** (0.007)		
Number of banks							-0.006** (0.002)	0.007 (0.011)
+ 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	0.045	0.270	0.043	0.296	0.044	0.354	0.033	0.228

Note: This table reports regressions for firms' export response to the crisis on the measures of relationship lending by subsamples based on firms' characteristics. 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 3 (see Table 1 and Section 4 for details). ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

The Following Supplement is Not Intended for Publication.

Supplementary Table S1 (not for publication). Robustness: Controlling for Domestic National Banks with International Branch Network

VARIABLES	(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	-0.042*** (0.015)					-0.036** (0.014)	0.025** (0.008)					0.023* (0.009)
Business plan		-0.028*** (0.010)				-0.013* (0.008)		0.012 (0.015)				0.000 (0.016)
Relationship length			0.002*** (0.001)			0.002*** (0.001)			-0.001*** (0.000)			-0.001*** (0.000)
Number of banks				-0.005** (0.002)		-0.005*** (0.001)				0.003*** (0.001)		0.004 (0.002)
Collateral					0.006 (0.009)						-0.013 (0.012)	
Age	0.001** (0.000)	0.000** (0.000)	0.000 (0.000)	0.001*** (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)
Size	0.003 (0.007)	0.002 (0.007)	-0.002 (0.006)	0.003 (0.006)	0.002 (0.008)	0.006 (0.006)	0.004 (0.005)	0.004 (0.004)	0.005 (0.005)	0.003 (0.003)	0.004 (0.005)	0.000 (0.007)
Labor productivity	-0.015* (0.008)	-0.015* (0.008)	-0.014** (0.007)	-0.022** (0.009)	-0.016*** (0.005)	-0.014 (0.009)	0.045*** (0.011)	0.044*** (0.010)	0.043*** (0.010)	0.045*** (0.002)	0.046** (0.013)	0.042*** (0.010)
Capital intensity	-0.006 (0.008)	-0.007 (0.008)	-0.008 (0.009)	0.003 (0.007)	-0.007 (0.009)	-0.004 (0.008)	-0.004 (0.009)	-0.003 (0.008)	-0.003 (0.009)	-0.008 (0.007)	-0.003 (0.009)	-0.005 (0.008)
Family	-0.040** (0.016)	-0.039*** (0.015)	-0.039*** (0.015)	-0.031*** (0.009)	-0.039** (0.016)	-0.040** (0.016)	0.024 (0.021)	0.024 (0.022)	0.021 (0.019)	0.017 (0.015)	0.024 (0.021)	0.022 (0.019)
Leverage	-0.075 (0.122)	-0.065 (0.123)	-0.065 (0.102)	-0.036 (0.032)	-0.084 (0.119)	-0.043 (0.105)	0.019 (0.074)	0.016 (0.077)	0.014 (0.063)	-0.008 (0.017)	0.030 (0.080)	0.002 (0.061)
Group	-0.020 (0.018)	-0.017 (0.016)	-0.012 (0.018)	-0.010 (0.010)	-0.019 (0.018)	-0.014 (0.021)	0.015 (0.017)	0.014 (0.016)	0.011 (0.018)	0.009 (0.012)	0.015 (0.017)	0.012 (0.018)
Domestic local bank	-0.013* (0.007)	-0.014* (0.008)	-0.012 (0.009)	-0.002 (0.004)	-0.018** (0.009)	-0.004 (0.008)	0.001 (0.016)	0.001 (0.016)	0.001 (0.015)	-0.007 (0.008)	0.003 (0.014)	-0.004 (0.014)
Foreign bank	-0.013 (0.027)	-0.012 (0.027)	-0.008 (0.026)	-0.006 (0.016)	-0.010 (0.026)	0.003 (0.025)	0.019 (0.026)	0.018 (0.025)	0.018 (0.026)	-0.001 (0.010)	0.017 (0.026)	0.012 (0.028)
Domestic national bank with international network	0.001 (0.015)	-0.001 (0.015)	-0.004 (0.014)	-0.006 (0.013)	-0.004 (0.014)	0.002 (0.016)	0.015 (0.017)	0.016 (0.019)	0.016 (0.019)	0.012 (0.012)	0.017 (0.018)	0.013 (0.019)
+ Country and ind. 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	0.0453	0.0435	0.0455	0.0335	0.0436	0.0502	0.049	0.048	0.049	0.037	0.049	0.051

Note: This table reports regressions for firms' export response to the crisis on relationship lending after controlling for finer fixed effects for domestic banks with national scope (taking into account the availability of an international branch network). 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 been doing business (columns 4, 6, 10 and 12). 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, industry and bank-ownership-size fixed effects. See Table 1 and Section 4 for details on the control variables. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Supplementary Table S2 (not for publication). Robustness: Including Finer Foreign Bank Fixed Effects

VARIABLES	(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	-0.042*** (0.013)					-0.035*** (0.013)	0.026** (0.008)					0.023* (0.011)
Business plan		-0.028*** (0.009)				-0.013* (0.008)		0.013 (0.014)				0.001 (0.016)
Relationship length			0.002*** (0.001)			0.002*** (0.001)			-0.001*** (0.000)			-0.001*** (0.000)
Number of banks				-0.005*** (0.002)		-0.006*** (0.001)				0.003*** (0.001)		0.004 (0.002)
Collateral					0.006 (0.009)						-0.013 (0.013)	
Age	0.000** (0.000)	0.000** (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)
Size	0.002 (0.008)	0.002 (0.008)	-0.002 (0.006)	0.003 (0.006)	0.001 (0.008)	0.006 (0.007)	0.004 (0.005)	0.005 (0.004)	0.006 (0.005)	0.004 (0.002)	0.004 (0.004)	0.000 (0.006)
Labor productivity	-0.015** (0.007)	-0.015** (0.007)	-0.015** (0.006)	-0.022** (0.009)	-0.017*** (0.004)	-0.014* (0.008)	0.046*** (0.011)	0.046*** (0.011)	0.044*** (0.011)	0.045*** (0.002)	0.048** (0.014)	0.043*** (0.010)
Capital intensity	-0.006 (0.008)	-0.007 (0.008)	-0.008 (0.009)	0.003 (0.007)	-0.007 (0.009)	-0.004 (0.008)	-0.004 (0.008)	-0.004 (0.008)	-0.003 (0.008)	-0.008 (0.007)	-0.003 (0.008)	-0.006 (0.008)
Family	-0.041** (0.016)	-0.040** (0.016)	-0.040** (0.016)	-0.031*** (0.009)	-0.040** (0.016)	-0.042** (0.017)	0.024 (0.023)	0.024 (0.023)	0.021 (0.021)	0.017 (0.016)	0.024 (0.023)	0.022 (0.021)
Leverage	-0.086 (0.127)	-0.075 (0.127)	-0.070 (0.102)	-0.037 (0.034)	-0.094 (0.124)	-0.051 (0.108)	0.018 (0.077)	0.014 (0.079)	0.011 (0.064)	-0.007 (0.017)	0.028 (0.081)	0.000 (0.063)
Group	-0.020 (0.019)	-0.018 (0.017)	-0.013 (0.019)	-0.009 (0.010)	-0.020 (0.018)	-0.015 (0.022)	0.016 (0.018)	0.015 (0.017)	0.012 (0.018)	0.009 (0.012)	0.017 (0.018)	0.013 (0.019)
Domestic local bank	-0.013* (0.008)	-0.014 (0.009)	-0.012 (0.010)	-0.001 (0.004)	-0.017* (0.010)	-0.005 (0.009)	-0.001 (0.015)	-0.001 (0.015)	-0.001 (0.014)	-0.008 (0.008)	0.001 (0.014)	-0.006 (0.013)
Foreign bank Germany	0.029 (0.121)	0.027 (0.122)	0.032 (0.108)	0.009 (0.074)	0.026 (0.123)	0.048 (0.109)	-0.023 (0.018)	-0.021 (0.018)	-0.013 (0.007)	-0.005 (0.016)	-0.022 (0.019)	-0.026* (0.012)
Foreign bank France	0.002 (0.004)	0.003 (0.004)	-0.001 (0.004)	0.025*** (0.004)	0.003 (0.004)	0.006* (0.004)	0.055*** (0.004)	0.055*** (0.004)	0.058*** (0.004)	0.003 (0.003)	0.054*** (0.004)	0.053*** (0.003)
Foreign bank Italy	-0.451*** (0.117)	-0.451*** (0.118)	-0.442*** (0.109)	-0.200 (0.212)	-0.457*** (0.118)	-0.445*** (0.116)	0.118*** (0.021)	0.118*** (0.019)	0.115*** (0.016)	0.041 (0.125)	0.119*** (0.021)	0.119*** (0.017)
Foreign bank UK	-0.138*** (0.018)	-0.137*** (0.018)	-0.116*** (0.005)	0.010*** (0.002)	-0.127*** (0.013)	-0.100*** (0.011)	0.086* (0.041)	0.084* (0.042)	0.079 (0.048)	-0.016 (0.023)	0.079 (0.045)	0.082 (0.048)
Foreign bank Spain	0.041** (0.016)	0.047*** (0.014)	0.046*** (0.011)	0.051*** (0.012)	0.048*** (0.014)	0.048*** (0.014)	-0.068*** (0.005)	-0.071*** (0.005)	-0.067*** (0.005)	-0.052*** (0.005)	-0.072*** (0.004)	-0.071*** (0.002)
Foreign bank (others)	0.010 (0.025)	0.008 (0.025)	0.011 (0.027)	-0.022 (0.020)	0.009 (0.023)	0.029 (0.028)	0.013 (0.025)	0.013 (0.024)	0.010 (0.023)	0.007 (0.010)	0.013 (0.024)	0.002 (0.027)
+ Country and ind. 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	0.0476	0.0458	0.0476	0.0345	0.0458	0.0523	0.051	0.050	0.050	0.038	0.050	0.053

Note: This table reports regressions for firms' export response to the crisis on measures of relationship lending after controlling for finer fixed effects for foreign banks (taking into account the country of origin of the banks). 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 been 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, industry and bank-ownership-size fixed effects. See Table 1 and Section 4 for details on the control variables. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Supplementary Table S3 (not for publication). Robustness: Controlling for Broad Export Area

VARIABLES	(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*** (0.012)					-0.036*** (0.012)	0.025** (0.008)					0.023* (0.011)
Business plan		-0.030*** (0.009)				-0.015** (0.007)		0.013 (0.014)				0.002 (0.016)
Relationship length			0.002*** (0.001)			0.002*** (0.001)			-0.001*** (0.000)			-0.001*** (0.000)
Number of banks				-0.005*** (0.001)		-0.005*** (0.001)				0.003*** (0.001)		0.004 (0.002)
Collateral					0.006 (0.010)						-0.013 (0.013)	
Age	0.000** (0.000)	0.000** (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)
Size	0.002 (0.009)	0.002 (0.009)	-0.002 (0.008)	0.003 (0.007)	0.001 (0.010)	0.005 (0.008)	0.003 (0.004)	0.004 (0.003)	0.005 (0.005)	0.003 (0.002)	0.003 (0.004)	0.000 (0.006)
Labor productivity	-0.015** (0.007)	-0.014** (0.007)	-0.014** (0.006)	-0.022*** (0.008)	-0.016*** (0.004)	-0.014* (0.008)	0.045*** (0.012)	0.045*** (0.011)	0.044*** (0.011)	0.045*** (0.002)	0.047** (0.015)	0.042*** (0.010)
Capital intensity	-0.007 (0.009)	-0.007 (0.009)	-0.008 (0.010)	0.003 (0.007)	-0.008 (0.010)	-0.004 (0.009)	-0.003 (0.009)	-0.003 (0.008)	-0.002 (0.008)	-0.007 (0.007)	-0.002 (0.009)	-0.005 (0.008)
Family	-0.041** (0.016)	-0.039** (0.016)	-0.039** (0.015)	-0.031*** (0.009)	-0.039** (0.016)	-0.041** (0.017)	0.025 (0.021)	0.024 (0.022)	0.022 (0.020)	0.017 (0.016)	0.024 (0.021)	0.022 (0.020)
Leverage	-0.078 (0.119)	-0.067 (0.120)	-0.066 (0.098)	-0.035 (0.030)	-0.087 (0.117)	-0.040 (0.101)	0.024 (0.073)	0.021 (0.076)	0.019 (0.062)	-0.005 (0.017)	0.035 (0.078)	0.007 (0.061)
Group	-0.019 (0.017)	-0.017 (0.015)	-0.012 (0.017)	-0.010 (0.009)	-0.019 (0.017)	-0.015 (0.020)	0.013 (0.016)	0.012 (0.016)	0.009 (0.017)	0.008 (0.012)	0.013 (0.016)	0.011 (0.018)
Domestic local bank	-0.013* (0.008)	-0.013 (0.009)	-0.012 (0.010)	-0.001 (0.004)	-0.017* (0.009)	-0.004 (0.009)	-0.001 (0.015)	-0.000 (0.015)	-0.001 (0.014)	-0.008 (0.008)	0.001 (0.014)	-0.005 (0.013)
Foreign bank	-0.013 (0.026)	-0.012 (0.026)	-0.008 (0.025)	-0.006 (0.017)	-0.011 (0.025)	0.003 (0.024)	0.018 (0.025)	0.017 (0.025)	0.017 (0.025)	-0.001 (0.011)	0.016 (0.025)	0.012 (0.027)
+ Broad export areas dummies (Europe, Asia, USA)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
+ Country and ind. 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	0.0467	0.0450	0.0468	0.0343	0.0449	0.0519	0.051	0.050	0.050	0.038	0.051	0.053

Note: This table reports regressions for firms' export response to the crisis on the measures of relationship lending after controlling for fixed effects capturing broad areas of export destination (Europe, Asia, USA). 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 been 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, industry, bank-ownership-size and broad area of export destination fixed effects. See Table 1 and Section 4 for details on the control variables. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Supplementary Table S4 (not for publication). Robustness: Controlling for Broad Export Area * Industry Dummies

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Probit	Probit	Probit	Probit	Probit	Probit	OLS	OLS	OLS	OLS	OLS	OLS
	Drop	Drop	Drop	Drop	Drop	Drop	Change	Change	Change	Change	Change	Change
	Export	Export	Export	Export	Export	Export	Export	Export	Export	Export	Export	Export
Interviews	-0.044*** (0.013)					-0.036*** (0.013)	0.029** (0.009)					0.025* (0.011)
Business plan		-0.033*** (0.010)				-0.017** (0.008)		0.017 (0.014)				0.005 (0.015)
Relationship length			0.002*** (0.001)			0.002*** (0.001)			-0.001*** (0.000)			-0.001** (0.000)
Number of banks				-0.005*** (0.001)		-0.006*** (0.001)				0.004** (0.001)		0.004 (0.003)
Collateral					0.006 (0.009)						-0.011 (0.015)	
Age	0.000** (0.000)	0.000** (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)
Size	0.001 (0.009)	0.001 (0.009)	-0.004 (0.008)	0.003 (0.008)	-0.000 (0.010)	0.005 (0.007)	0.006* (0.003)	0.007** (0.002)	0.008* (0.003)	0.004 (0.002)	0.006* (0.003)	0.002 (0.005)
Labor productivity	-0.012* (0.007)	-0.011 (0.007)	-0.010* (0.006)	-0.021** (0.008)	-0.013*** (0.004)	-0.010 (0.008)	0.039*** (0.010)	0.038*** (0.010)	0.036** (0.010)	0.043*** (0.003)	0.040** (0.014)	0.035*** (0.009)
Capital intensity	-0.009 (0.010)	-0.009 (0.010)	-0.010 (0.010)	0.000 (0.006)	-0.010 (0.010)	-0.006 (0.010)	0.002 (0.009)	0.002 (0.008)	0.002 (0.008)	-0.004 (0.007)	0.003 (0.009)	-0.001 (0.008)
Family	-0.039** (0.016)	-0.038** (0.015)	-0.038** (0.015)	-0.028*** (0.008)	-0.038** (0.016)	-0.040** (0.016)	0.024 (0.022)	0.024 (0.022)	0.021 (0.019)	0.016 (0.015)	0.023 (0.022)	0.022 (0.020)
Leverage	-0.073 (0.117)	-0.061 (0.118)	-0.064 (0.093)	-0.030 (0.029)	-0.083 (0.117)	-0.035 (0.093)	0.029 (0.073)	0.024 (0.076)	0.022 (0.061)	-0.005 (0.017)	0.038 (0.079)	0.007 (0.059)
Group	-0.022 (0.018)	-0.019 (0.016)	-0.014 (0.017)	-0.011 (0.011)	-0.021 (0.017)	-0.017 (0.020)	0.016 (0.018)	0.014 (0.018)	0.012 (0.019)	0.008 (0.013)	0.016 (0.019)	0.013 (0.019)
Domestic local bank	-0.013 (0.008)	-0.013 (0.009)	-0.011 (0.010)	-0.001 (0.004)	-0.017* (0.009)	-0.003 (0.009)	-0.000 (0.016)	0.000 (0.016)	0.000 (0.016)	-0.008 (0.009)	0.002 (0.015)	-0.005 (0.014)
Foreign bank	-0.014 (0.027)	-0.013 (0.027)	-0.009 (0.026)	-0.009 (0.018)	-0.011 (0.025)	0.003 (0.026)	0.018 (0.027)	0.017 (0.026)	0.016 (0.027)	0.001 (0.011)	0.016 (0.027)	0.010 (0.030)
+ Industry * Broad export area dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
+ Country dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2,844	2,846	2,799	4,897	2,841	2,790	2,847	2,849	2,802	4,901	2,844	2,793
Pseudo R-squared	0.0490	0.0474	0.0492	0.0372	0.0470	0.0547	0.056	0.055	0.056	0.039	0.055	0.059

Note: This table reports regressions for firms' export response to the crisis on measures of relationship lending after controlling for fixed effects for broad area of export destination*industry. 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 been doing business (columns 4, 6, 10 and 12). 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 fixed effects, industry * export area fixed effects, and bank-ownership-size fixed effects. See Table 1 and Section 4 for details on the control variables. ***, **, * denote significance at the 1%, 5%, and 10% level, respectively.