

Katja Neugebauer and Julia Spies

Borrowing locally, operating globally? Financing and trading patterns of firms during the economic crisis

EFIGE working paper 55
August 2012

Funded under the
Socio-economic
Sciences and
Humanities
Programme of the
Seventh
Framework
Programme of the
European Union.

LEGAL NOTICE: The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 225551. The views expressed in this publication are the sole responsibility of the authors and do not necessarily reflect the views of the European Commission.



The EFIGE project is coordinated by Bruegel and involves the following partner organisations: Universidad Carlos III de Madrid, Centre for Economic Policy Research (CEPR), Institute of Economics Hungarian Academy of Sciences (IEHAS), Institut für Angewandte Wirtschaftsforschung (IAW), Centro Studi Luca D'Agliano (Ld'A), Unitcredit Group, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

The EFIGE partners also work together with the following associate partners: Banque de France, Banco de España, Banca d'Italia, Deutsche Bundesbank, National Bank of Belgium, OECD Economics Department.

Borrowing Locally, Operating Globally?

Financing and Trading Patterns of Firms during the Economic Crisis *

Katja Neugebauer[†] Julia Spies[‡]

August 27, 2012

Abstract

The theory of relationship lending is based on the idea that close ties between borrowers and banks may be economically beneficial. Information asymmetries on the part of the bank introduce adverse selection and moral hazard problems into the lending process and may lead to a lengthy decision process and/or reduce the availability of credit for firms. The recent financial and economic crisis, which has been marked by increased uncertainty about the creditworthiness of firms, has reduced the quantity of available credit or raised its costs. Being able to turn to a main bank might reduce the problem of information asymmetries and enable firms to maintain access to credit in times of economic hardship. This paper investigates whether relationship lending has played a role in explaining crisis-related trade reductions at the firm level. We find no consistent impact of relationship lending on export reductions: Only in Italy, local banks have clearly shielded firms from trade reductions. Overall, factors such as the age, employment, and financial dependence of the firm are more robust determinants of export changes.

Keywords: relationship lending, main bank, trade finance, trade collapse
JEL: G20, G21, F14

*The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 225551. The views expressed in this publication are the sole responsibility of the authors and do not necessarily reflect the views of the European Commission. Elitza Milenkova, Marie-Christin Scholl, Simone Schotte, and Lena Warsow have provided most efficient research assistance. All errors and inaccuracies are solely in our own responsibility.

[†]Institute for Applied Economic Research (IAW), Ob dem Himmelreich 1, D-72074 Tuebingen, +49-7071-989634, katja.neugebauer@iaw.edu

[‡]International Trade Centre (ITC), Palais des Nations, CH-1211 Geneva

1 Introduction

In light of the recent financial crisis, the concept of relationship lending has gained renewed attention. Boot (2000, p.10) defines relationship lending as “the provision of financial services by a financial intermediary that (1) invests in obtaining customer-specific information, often proprietary in nature; and that (2) evaluates the profitability of these investments through multiple interactions with the same customer over time and across products”, indicating that the theory of relationship lending is based on the idea that close ties between borrowers and banks may be economically beneficial. Difficulties in gathering information about the borrower introduce adverse selection and moral hazard problems into the lending process and may lead to lengthy decision processes and/or reduce the availability of credit. This is especially problematic in times of crises when credit supply is tight. Small firms, which are often opaque with respect to information, are particularly likely to suffer from resulting credit constraints. As such, they have been the subject of numerous studies on relationship lending (see e.g. Petersen and Rajan, 1994, Petersen and Rajan, 1995, or Berger and Udell, 1995), which provides one possibility of reducing information asymmetries, thereby facilitating access to credit.

The recent financial and economic crisis, which has been marked by increased uncertainty about the creditworthiness of firms, has reduced the quantity of available credit markedly or raised its costs (see e.g. Chor and Manova, 2012). While there is plenty of anecdotal evidence on the renaissance of relationship lending, which gives advantages to firms in “difficult times” (Handelsblatt, 18/06/2009), formal studies investigating the role of main banks in dampening the crisis’ effect on firms’ global operations are still missing. This paper seeks to fill this gap by linking crisis-related trade reductions with the bank type used at the firm level. Relationship lending should be especially valuable during times of credit crunch. Exporters with access to a main bank might have experienced less pronounced export reductions compared to firms that did not engage in relationship lending.

Our research combines two strands of the literature. On one hand, this study is related to the literature on the determinants and economic consequences of relationship lending. Of particular interest are the few studies that focus on questions of physical proximity between the lender and the borrower. Mian (2006), e.g., shows that greater geographical or cultural distance between the lender and the borrower leads to information costs that make it difficult for foreign banks to renegotiate or recover bad loans. On the other hand, this paper relates to the body of literature that investigates the impact of a lack of trade credit on the 2007/2008

trade collapse. One major phenomenon of the recent crisis has been the substantial collapse of international trade and foreign direct investment (FDI).¹ Empirical studies suggest that short-run disruptions in the availability of finance can help explaining the downturn (see e.g. Amiti and Weinstein, 2009, or Chor and Manova, 2012).

To the best of our knowledge, no study so far has investigated the relationship between the bank type used by firms and international trade. One reason for this lies in the fact that information about the bank type that firms use is seldom available. In this paper, we use the recently compiled EU-EFIGE/Bruegel-UniCredit Survey, which contains questions that allow us to extract information on relationship lending. This dataset consists of comparable firm-level data for firms in seven EU countries and also contains questions on firm financing. For our empirical analysis, we complement the survey with other firm characteristics taken from the Amadeus database, as provided by Bureau van Dijk.

In our empirical analysis, we proceed in two steps. In the first step, we study the extensive margin of export reductions, i.e. we look at the probability that a firm experienced a reduction in its exports in dependence on a number of firm- and sector-level characteristics. In the second step, we look at the intensive margin of export reductions, i.e. at the actual extent of the export reductions. This two-step approach links to the findings of Paravisini et al. (2011), who show that during the crisis exports reacted strongly at the extensive as well as at the intensive margin. Our primary focus in both cases is on the type of bank the firm uses to finance its foreign activities. Our results indicate that relationship lending has not played a major role for exports during the 2008 economic crisis. Whereas the collaboration with local banks seems to have protected Italian firms from export reductions, overall, traditional factors, such as the firms' age, size or (their sector's) financial dependence provide much more robust explanations of crisis-related changes in exports.

The rest of the paper is structured as follows: in section 2, we review the two strands of literature to which our study relates. In section 3, we present the EFIGE survey, which is the backbone of our analysis, as well as some descriptive evidence. In section 4, we discuss the employed econometric methodology. Results are presented in section 5. Section 6 concludes.

¹See, e.g., Neugebauer and Spies (2012) for evidence on the German export market and Békés et al. (2012) for the Hungarian one.

2 Related Literature

This section gives an overview of the two strands of literature which this paper builds upon. First and foremost, it relates to studies on the determinants and economic consequences of relationship lending.²

Several studies investigate the direct impact of relationship lending on the availability of credit. Focusing on small firms, evidence for the U.S., Germany and Italy suggests that the duration of the relationship between a firm and its bank is positively related to the availability of credit (Petersen and Rajan, 1994, Harhoff and Körting, 1998, and Angelini et al., 1998). Jiangli et al. (2008) confirm that well-established lending relationships eased credit availability during the Asian crisis of 1997. They consider the strength of a relationship to be negatively dependent on the number of banks from which the firm borrows. They also stress the role of financial transparency in the lending process, which can substitute or complement a long-term relationship. Mitri et al. (2010) investigate the economic crisis of 2008 and support the finding that credit availability increases if the scope of the bank-firm relationship is smaller and the duration longer.

In addition to the number of employed banks, the intensity of a bank-firm relationship is frequently measured by the physical distance between them. Whereas Petersen and Rajan (2002) show that physical distance between the borrower and the lender has increased between 1973 and 1993 for small U.S. firms and banks, Buch (2005) suggests that technological change has not reduced information asymmetries and that distance keeps playing an important role in international banking. Several empirical studies confirm that greater physical distance between the lender and the borrower reduces the availability of credit (see e.g. Brevoort and Hannan, 2006, or Agarwal and Hauswald, 2007). Brevoort and Hannan (2006) find that distance matters more for small firms. Other studies stress the importance of headquarters as the deciding part in the lending process, measuring the distance between headquarters of the lending bank and the operating branch of the borrowing firm (see e.g. Alessandrini et al., 2009, Jiménez et al., 2009, or Liberti and Mian, 2009).³ A recent theoretical paper by Hauswald and Marquez (2006) sheds light on the role of competition in distance and lending, suggesting that if competition rises, banks reduce investments in information

²For a comprehensive overview of the literature on relationship lending, see also Elyasiani and Goldberg (2004), and Degryse et al. (2009).

³More recent studies add social or physical distance as determinants of the loan outcome. According to Mian (2006), foreign banks seem to be less engaged in relationship lending because a larger distance to the borrower raises additional information and agency costs. Fisman et al. (2011) find that social proximity contributes to a rise in both the amount of lending as well as the number of loan recipients.

acquisition. This can lead to a less efficient credit allocation. More fierce competition may thus imply a shift of resources to cases which require less informational efforts, such as relationship lending to geographically close firms (Hauswald and Marquez, 2006, and Brevoort and Hannan, 2006).

Several studies confirm the finding that banks use different lending strategies, depending on their own size and distance from the borrowing firm. Usually, small local banks tend to specialize in relationship lending to comparably small, young and opaque firms, while large and distant banks engage more in transaction lending to large transparent firms (see e.g. Casolaro and Mistrullia, 2008, Jiménez et al., 2009, Berger et al., 2005, or Cole et al., 2004). However, Berger and Black (2011) conclude that the comparative advantage of large banks in lending on the basis of hard information depends on the specific type of hard information technology used. This allows for different combinations of fixed-asset lending technologies such as commercial real-estate lending and equipment loans. Furthermore, small banks have a comparative advantage in long-term bank-firm relationships, and this advantage grows when dealing with larger instead of smaller firms. An interesting contribution to the literature has recently been made by Beck et al. (2011). They find that lending relationships between small domestic banks and SMEs is not the most convenient form of financing for small firms, but that large and foreign banks with more arm's length lending technologies also provide important sources of financing SMEs.

The second strand of literature that is related to this study aims at explaining the downturn of international trading activities during the 2007/2008 economic crisis. Besides channels like inventory adjustments or global value chains, various studies investigate the role of external finance in the collapse of international trade and FDI.⁴ Amiti and Weinstein (2009) provide evidence on the link between exporting firms and the banks they use for financing. They show that exports are hit seven times harder than domestic sales through a lack of trade finance during banking crises. Feenstra et al. (2011) offer some theory on why credit for exporting or purely domestic firms is treated differently. Indeed, exporting firms face tighter credit constraints on both markets. They have to bear additional fixed costs, the time lag between production and inflow of sales revenue is longer, and their default risk is higher (Feenstra et al., 2011). Building upon a similar idea, Chor and Manova (2012) suggest that the effects of adverse credit conditions on international trade are especially

⁴For a study on inventory adjustments, see e.g. Alessandria et al., 2010. Recent work by Altomonte et al. (2011) studies the global value chain, whereas for the role of external finance, see e.g. Cappiello et al., 2010 and Dell'Araccia et al., 2008.

pronounced in vulnerable sectors that, for example, rely heavily on external finance, have limited access to trade credit, or have few collateralizable assets. Bricongne et al. (2012) use firm-level data for French exporters in order to explain the drop in international trade during the economic crisis of 2008. The degree to which a sector externally depends on finance significantly reduces the firm’s export performance (Bricongne et al., 2012). Another recent empirical paper finds that exports reacted strongly to the short-run credit shortage at the intensive, as well as at the extensive, margin during the economic crisis (Paravisini et al., 2011).⁵

In spite of the numerous contributions to both strands of literature, researchers have so far either studied the impact of relationship lending on credit availability *or* they have investigated the impact of credit shortages on trade. The interconnectedness between these two topics has not yet been taken into account. We aim at bridging together these two fields of research by analyzing the impact of relationship lending on export performance during the crisis. Closest to our study is an article by Herrera and Minetti (2007), which shows that persistent bank-firm relationships have positive effects on firms’ innovation activities. They use a sample of Italian firms and find that the positive effect of relationship lending is more pronounced for product than for process innovation. This positive effect is realized through the provision of funds that are needed for the introduction and purchase of new technologies.⁶

3 Data and Descriptive Statistics

This section provides a detailed overview of the data that we use in this paper. Special emphasis is given on the description of the new firm-level dataset that we employ. Furthermore, some descriptive statistics that shed light on the structure of the export reductions will be presented.

⁵Campello et al. (2010) confirm that especially constrained firms were affected by the lower availability of credit in 2008, resulting e.g. in less R&D investment and less employment. In a more general context, Nilsen (2002) adds that both small and large firms are affected by hindered access to bank loans in times of strict monetary policy. Puri et al. (2011) use the global supply of credit to investigate the real effects of the financial crisis. One of their conclusions is that stable bank-firm relationships can reduce the supply-side effects, i.e. mitigate the contraction in the supply of retail lending.

⁶In parallel and independent research, Bronzini and D’Ignazio (2011) are currently investigating the link between financial constraints and export performance using the EFIGE survey and the Bank of Italy Survey of Industrial and Service Firms. However, they do not investigate the type of bank the firms use for their exporting activities, which we include explicitly into our regression analysis.

3.1 Data

The backbone of our analysis is the EU-EFIGE/Bruegel-UniCredit Survey. It is part of the EFIGE project (European Firms in the Global Economy) which analyzes the competitiveness of European firms in a comparative perspective. The survey is a harmonized cross-country dataset containing quantitative as well as qualitative information on approximately 150 items for a representative sample of about 15,000 manufacturing firms in the following countries: Austria, France, Germany, Hungary, Italy, Spain, and the United Kingdom. These items cover international strategies, R&D, innovation, employment, financing, and organizational activities of firms before and after the financial crisis. Its focus on pre- and post-crisis performance makes it particularly suitable for the research question studied in this paper.

Information about the bank type firms use is rarely contained in commonly available datasets. The EU-EFIGE/Bruegel-UniCredit Survey contains questions that allow us to extract information on relationship lending. Specifically, we use the question “What type of bank/credit institution does the firm use for...?” with 2×3 possible answers (domestic or foreign activities on one hand, and domestic local, domestic national or foreign banks on the other hand). We will focus on the bank type used for the firms’ foreign activities and combine this question with information on the reduction or increase of that same firm’s export value in 2009 (in comparison to 2008). The information on the firms’ export reduction is first evaluated at the extensive margin in order to determine the probability of an export reduction, and second at the intensive margin to determine the extent of export reductions.

Furthermore, taking account of the findings of Chor and Manova (2012) and Bricongne et al. (2012), we control for industry and firm dependence on external finance. Industry dependence measures the degree of financial dependence of all firms working in the same sector. The variable for financial dependence at the firm level indicates whether a firm which uses external financing was confronted with an increase in debt costs during the financial crisis. Referring to the empirical literature which reports that smaller and younger firms tend to engage in relationship lending, we control for the firm’s size (as measured by the number of employees) and its age. Additionally, we include a dummy variable for companies that belong to a group. Descriptive evidence of Neugebauer and Spies (2012) suggests that firms which belong to a global network have suffered less from the crisis. By contrast, Altomonte et al. (2011) provide results of a faster drop and a faster rebound of intra-firm trade. By including a group dummy, we control for the effects of a company’s global network on the firm’s performance during the crisis. Furthermore, we include the diversification of the firm’s

product portfolio in terms of the share of the firm's core product in the total turnover. A well-diversified product portfolio can help shield firms against negative shocks.

Whereas the survey contains information on the main variables of interest, namely the bank-type dummy variable and the reduction of exports during the crisis, it does not provide detailed balance-sheet information at the firm level. We make use of the fact that the firms surveyed are given a Bureau van Dijk (BvD) identifier, which makes the matching with other BvD commercial firm-level data relatively easy. Hence, we collect information on firms' characteristics that influence (i) their likelihood of becoming an exporter and (ii) their resilience to the recent financial crisis from Bureau van Dijk's *Amadeus* database. Although we neither have information on the banks involved in the lending relationship, nor on the countries where the banks are located, we can control for heterogeneity at the level of the home country of the borrowing firm.

3.2 Descriptive Statistics

We start by demonstrating that the export reductions that European firms experienced during the financial crisis vary considerably across the firms' home countries. Figure 1 displays the share of firms with small, moderate and large export reductions for the seven countries contained in the EU-EFIGE/Bruegel-UniCredit Survey. Compared to the other countries, firms based in Hungary faced the largest export reductions during the financial crisis. The share of Hungarian firms reporting moderate or high export reductions exceeds the percentage of moderate and high export reductions that were reported in other countries. While firms in Spain, France and Italy also faced relatively high reductions in exports, exports of firms in the UK, Germany and Austria were less affected during the financial crisis.

Next, we provide descriptive evidence on the link between relationship lending and firm performance. We focus on explaining the crisis-related trade reduction with the specific bank type used at the firm level. In line with literature assigning an important role to distance in the lending process, we use the geographical proximity between the lender and the borrower as a proxy for relationship lending. The EFIGE dataset also provides information on the level of export reduction or increase in 2009 compared to 2008 in terms of value of the export activities. We use this information to measure the firms' export performance.

Figures 2 and 3 display the relation between the geographical distance between lender and borrower, as well as the export performance during the crisis. Presumably, domestic local banks are located in closer proximity to firms than domestic national or foreign banks

and might therefore have more and better information about their borrowers.

Figure 2 presents evidence on the *extensive margin* of export performance by calculating the share of firms with a positive, negative, or with no change in exports. Firms which use a local bank to finance their exporting activities were less likely to experience a drop in exports. By contrast, the share of firms with local banks whose exports remained unchanged or even increased was higher compared to other firms.

This result supports the hypothesis of a close bank-firm relationship providing a stable financing source for firms, even in difficult times. It is also in line with Mayer (1988) and Petersen and Rajan (1995) who suggest that firms and banks can share risk intertemporally.

Figure 3 presents evidence on the *intensive margin* of export performance by displaying the level of export reductions. According to Figure 3, there is no major difference between the export performance of firms using domestic local banks and those using foreign banks. The net export reduction is the largest for firms with domestic national banks.

Summing up, we find considerable evidence that our hypothesis holds at the extensive margin. Firms which used local banks to finance their foreign activities were less likely to experience an export reduction during the crisis. The picture is less clear for the intensive margin. The average level of export reduction for firms with domestic local banks compared to foreign banks does not differ considerably.

4 Empirical Methodology

The EFIGE survey allows us to assess the crises-related export reduction of firms along both margins of trade. The extensive margin tells us whether a firm experienced an export reduction, whereas the intensive margin tells us about the magnitude of this reduction. First of all, we determine the factors that influence the *probability* of an export reduction, i.e. the extensive margin. We then go on and take a closer look at the *extent* of this reduction, i.e. the intensive margin.

4.1 The Extensive Margin of Export Reduction

First, we want to assess the determinants of export reductions at the *extensive* margin. To this end, we use a probit model where the dependent variable is a $[0; 1]$ dummy, indicating if a firm experienced an export reduction. The standard probit model does not account for a possible selection bias in our sample that occurs because firms self-select themselves into the exporter status. Specifically, we want to disentangle the impact of relationship lending

from other factors that may have increased a firm's resilience to the recent crisis and that are also correlated with the probability of becoming an exporter. In line with the well-established literature that postulates a strong link between firm productivity and export status (see, among others, Bernard et al., 2003, Bernard and Jensen, 1999, Melitz, 2003), we first estimate the probability that a firm engages in export activities depending on its labor productivity (measured as sales over employees), as well as on a set of industry and country fixed effects ($exp_{ikj} = f(\varphi_i, D_j, D_k)$). We then augment the probit equation by the inverse Mills ratio obtained from the selection equation. This procedure can be implemented by estimating a probit model with sample selection (Van de Ven and Van Praag, 1981), which is similar to the well known Heckman selection model (Heckman, 1979) that we will use for estimating the intensive margin. The bivariate probit model is as follows:

$$y_j^* = x_j\beta + \xi_{1j}, \quad (1)$$

where we only observe the binary outcome

$$y_j^{probit} = (y_j^* > 0). \quad (2)$$

Equation (1) is called the latent equation, whereas (2) is the probit equation. The problem now is that the dependent variable is not always observed because not all firms export. Technically speaking, we only observe the dependent variable for observation j if

$$y_j^{select} = (z_j\gamma + \xi_{2j} > 0) \quad (3)$$

with

$$\xi_1 \sim N(0, 1)$$

$$\xi_2 \sim N(0, 1)$$

$$corr(\xi_1, \xi_2) = \rho,$$

and where (3) is called the selection equation. If $\rho \neq 0$, the estimation of (1) with the usual probit techniques yields biased results.

Therefore, we estimate the following probit model with sample selection:

$$drop_{ikj}^{ex*} = \alpha_1 type_i^N + \alpha_2 dep_{i,k} + \alpha_3 type_i^N \times dep_{i,k} + \alpha_4 x_i + \alpha_5 D_j + \alpha_6 D_k + \nu_{ikj}, \quad (4)$$

where

$$drop_{ikj}^{ex} = \begin{cases} 1 & \text{if } drop_{ikj}^{ex*} > 0 \\ 0 & \text{otherwise.} \end{cases}$$

The dependent variable $drop_{ikj}^{ex*}$ is an indicator variable that takes the value of 1 if the firm experienced an export drop and 0 otherwise. The main explanatory variable of interest is the bank type chosen by a firm i , $type_i^N$, where superscript N may refer to a local domestic bank, a national domestic bank, or a foreign bank. With $dep_{i,k}$, we control for the financial dependence of the firm i or the sector k . This is motivated by the vast evidence on financial constraints being partially responsible for the latest trade collapse (see Section 2). As the importance of the chosen bank type may differ with the financial dependence of the firm or the sector in which the firm operates, we also include an interaction term between both variables. x_i are other characteristics of the firm possibly related to its export performance. These include the firm's age, its size, whether it belongs to a group and whether it has a diversified product portfolio. D_j and D_k are dummy variables capturing differences across the firms' home countries j and their sectors k .

4.2 The Intensive Margin of Export Reduction

Secondly, we substitute the dummy dependent variable by the percentage of export reduction of the respective firm in order to study the effects at the *intensive margin*. The resulting equation that needs to be estimated looks as follows:

$$drop_{ikj}^{in*} = \beta_1 type_i^N + \beta_2 dep_{i,k} + \beta_3 type_i^N \times dep_{i,k} + \beta_4 x_i + \beta_5 D_j + \beta_6 D_k + \epsilon_{ikj}. \quad (5)$$

The dependent variable $drop_{ikj}^{in*}$ is continuous and indicates by how much exports dropped in a certain company. Equation 5 will be estimated using a standard Heckman selection model. Since we have no indication that the determinants influencing the extensive and the intensive margin differ, equations 4 and 5 contain the same set of explanatory variables.

5 Estimation Results

This section presents the estimation results from the baseline setups described in section 4. Tables 1-4 present regression results for the bivariate probit model and the standard

Heckman selection model. We assess the link between the bank type and export reductions, along with the financial dependence of the industry (Tables 1 and 3) or the firm (Tables 2 and 4). In each table, we first look separately at the chosen bank type and financial dependence. We then introduce an interaction term between these two variables, thereby accounting for potential differences in the importance of financial constraints, depending on the bank type used. Finally, we add other firm characteristics which may be related to the drop in exports.

5.1 The Extensive Margin

Table 1 reports the results for a bivariate probit model of sector dependence with respect to external finance on export reduction during the crisis. The dependent variable is a dummy variable indicating whether a company experienced a reduction in exports in 2009 compared to 2008. In the baseline specification in column (1), we measure the impact of industry dependence on external finance and the impact of using a local bank to finance foreign activities at the extensive margin of export reduction. Looking at the effect that industry dependence on external financing exerts on export reduction, we see that it is highly significant and enters with a positive sign throughout all specifications. This is in line with expectations: the more dependent an industry is on external financing, the larger the probability that the firm faces an increased probability of an export decline during times of crises. This finding is also in line with Bricongne et al. (2012), who find that the degree to which a sector externally depends on finance significantly reduces a firm's export performance. The dummy indicating the use of a local bank enters with the expected negative sign, but is insignificant. This is interesting as the theory of relationship lending would call for a negative and significant effect. In column (2), we augment the baseline specification by an interaction term of industry dependence on external finance and the type of bank used. This also turns out to be insignificant. The result speaks against a cushioning impact of relationship lending on export declines. Column (3) includes additional explanatory variables specifying the age of the company, a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio, and employment. Only the age variable turns out to be significant, indicating that older firms had a significantly lower probability of experiencing an export reduction. In column (4), we report the baseline specification when domestic national banks instead of domestic local banks are used to finance foreign activities. The respective dummy turns out to be positive and significant, indicating that having a national bank as a main bank *increased* the probability of an export reduction. Adding

an interaction term with industry dependence on external financing in column (5) leaves the overall results unchanged. These results also hold when adding further explanatory variables in column (6). Columns (7)-(9) repeat the exercise for the use of foreign banks in foreign activities. However, this dummy and the respective interaction term are insignificant.

Table 2 reports the results for the bivariate probit model, focusing on the impact of firm dependence on external financing. The dependent variable is again a dummy variable indicating whether a company experienced a reduction in exports in 2009 compared to 2008. We include a negative cost of a financing shock in 2009, indicating whether or not companies with external financing had to face an increase in the cost of debt during the crisis. This coefficient is highly significant and positive in all model specifications, pointing to a higher probability of an export reduction if a firm resorts to external financing and experiences higher costs of debt. The rest of the results in this Table are comparable to Table 1. Again, we do not find evidence for a positive effect of relationship lending (measured as using a domestic local bank). As in Table 1, using a national bank enters with a significant and positive coefficient. Using a foreign bank neither increases nor decreases the probability of an export decline.

5.2 The Intensive Margin

Table 3 shows the results for the Heckman selection model of sector dependence with respect to external financing on export reductions. The dependent variable is the percentage of export reduction of companies during the crisis, mirroring the intensive margin. Again, we estimate a baseline specification and expand it further by including interaction terms and additional explanatory variables.

The coefficient of industry dependence on external finance is positive throughout all specifications, pointing to a higher level of export decline of firms in industries that are more dependent on external finance. Furthermore, we find a strong impact of firm size (measured by the number of employees) on the extent of the export reduction: the larger the firm in terms of employees, the smaller the extent of export reduction. This is an interesting finding as it implies that smaller firms were affected more heavily by the crisis in terms of exports. Looking at the type of bank used by firms, the results are not that clear cut. However, they seem to point in the direction that using a local bank did not shield firms from large export declines. Indeed, the coefficients on dummies that indicate the use of a national or a foreign bank are negative and significant, though these effects vanish when interacting

the respective dummies with the sector dependence on external finance. This indicates that the type of bank used by the firms does not seem to play a large role when looking at the intensive margin. Adding further explanatory variables results in a significant and negative coefficient on employment, indicating that larger firms, in terms of employment, experienced a less pronounced output decline during the crisis.

Table 4 reports the results for the regression model of firm dependence with respect to external financing on export reductions. The dependent variable is again the percentage of export reduction of companies during the crisis. In contrast to the probit specification in Table 2, we find no significant impact of financing shocks on the intensive margin of exports. This result is stable throughout the different specifications. This time, however, there is stronger evidence that using a national or foreign bank somewhat shielded firms from heavy declines in export reduction.

5.3 Robustness Checks

We check the robustness of our results along various dimensions. We employ a different estimation technique for assessing the effects at the intensive margin, we extend the data to include also export increases, and we run separate country-specific regressions to assess systematic differences in the lending process across the countries covered by the survey.

Fractional Logit

Our dependent variable captures the percentage drop of a firm’s export value. It is therefore limited to the range between 0% and 100%, with a share of observations at the two boundaries. Papke and Wooldridge (1996) propose a fractional response model based on a generalized linear model which allows to obtain robust estimates of boundary values that do not require any ad hoc transformation. We rescale the dependent variable to the range of [0;1] by dividing it by 100 and employ a fractional logit. As we do not want to dispense with the selection approach, we employ a “manual” two-step procedure. In the first stage, we estimate the probability of being an exporter and construct the Mills ratio from this estimation. In a second step, we plug the inverse Mills ratio into the fractional logit equation. To account for the fact that the inverse Mills ratio was already generated from the first-step regression, we apply bootstrapped standard errors. Results are presented in Tables 5 and 6.

Table 5 confirms the positive coefficient of industry dependence on external finance re-

ported in Table 3. Since the coefficient is not significant throughout all different specifications, the result of a higher export decline of firms in industries that are more dependent on external finance is somewhat weaker. Even though the qualitative results for the type of bank used remain by and large unchanged, the significance of the coefficients vanishes completely. Adding further explanatory variables, we find again a significant and negative coefficient of employment, indicating that larger firms experienced a less pronounced output decline during the crisis.

The results in Table 6 point into a similar direction. In contrast to the specification in Table 4, we find no significant impact of financing shocks on the intensive margin of exports. This result is stable throughout the different specifications. Again, the type of bank used by firms does not seem to influence the extent of export decline.

Positive and Negative Export Changes

So far, we have only looked at export *reduction*. However, a significant share of the firms in our sample experienced an *increase* in exports between 2008 and 2009. We therefore estimate a Tobit model, looking at the impact of the bank type used on the overall changes in exports. The Tobit model is used in order to account for the fact that the dependent variable has a lower limit (-100%), whereas an upper bound does not exist. Results are presented in Table 7. Industry dependence now enters with a negative sign, indicating that the more firms in the respective industry depend on external finance, the weaker the output increase (or the larger the reduction). This is in line with our previous results. Age and employment both enter with a positive sign, indicating that older and larger firms experienced less severe export reductions or even larger export increases. Again, we find no consistent effect of the type of bank used on export changes.

Country-Specific Results

In unreported regressions, we examine whether the effect of the bank type on export reductions differs across countries.⁷ Due to limitations in data availability, we can only get reliable results for Germany, Italy, Spain and France.

Looking first at the extensive margin of export reductions, we find some differences between the four countries. The first striking result we get is that there exists a large and significant impact of using domestic local banks in Italy: Firms that financed their foreign operations through this bank type had indeed a lower probability of an export decline. This

⁷Results can be obtained from the authors upon request.

is in line with Gobbi and Sette (2012), who find a strong impact of relationship lending using 2008/2009 data from the Italian Credit Register. However, this result contrasts with the other countries where we find no such effect. Using domestic national banks increased the probability of experiencing an export decline in Germany and France, but not in Spain and Italy. Finally, we find a weakly significant impact of collaborating with foreign banks in Germany, pointing towards a reduction in the probability of an export decline.

There are strong differences along the intensive margin for the different countries as well. Whereas we find an impact of local banks in increasing the extent of the export decline in Germany, this effect is not present in the other countries. Domestic national banks enter with a negative sign for all countries, indicating a cushioning effect on the extent of the export reduction. However, this effect is insignificant in the case of France. Furthermore, we do find a mitigating effect of foreign banks in Spain and France on the extent of export reduction.

6 Conclusions

The past economic crisis has seen a large decrease in international trade. One of the primary reasons for this was a lack of financing opportunities for firms as financial markets largely dried up. This was especially true for banks, the most important creditors for firms, who engaged in credit rationing, which in turn led to a credit crunch. One reason for credit rationing is information asymmetries that banks face with regard to their customers. From the point of view of the firm, one way to at least partially overcome this problem might be to use a main bank, i.e. one bank that handles most of the firm's financing activities. In doing so, the bank collects information about this firm over a long time span and faces less uncertainty concerning its creditworthiness in times of crises. Therefore, firms that use main banks often have better access to credit in times of crises compared to firms that do not have a main bank. The literature on relationship lending deals with this topic.

This paper is, to the best of our knowledge, the first formal study investigating the role of main banks in the crisis' effect on firms' global operations. Using novel firm-level survey data, the EU-EFIGE/Bruegel-UniCredit Survey, we have been able to link crisis-related trade reductions with the bank type used by firms.

Descriptive evidence suggests that the extent of export reductions of European firms during the crisis varied greatly, with Hungary and Spain being the countries that were hit the hardest. Furthermore, firms that used local banks to finance their exporting activities

were less exposed to export drops in comparison to firms that used national or foreign banks. A purely descriptive inspection of the data therefore suggests that relationship lending played a role during the economic crisis, but mostly affected firms through the extensive margin of an export reduction.

Our econometric analyses do not confirm this hypothesis. While there is some evidence that local banks reduced the likelihood of an export drop for Italian firms, overall, results are at best mixed. In fact, when running regressions in which we pool together the seven countries covered in the survey, our findings point rather to a prominent role of traditional explanatory factors of the crisis. The results confirm the previous literature that a firm's age, its size and dependence on external finance have co-determined export reductions during the 2008 economic crisis.

References

- Agarwal, S., Hauswald, R. B. H., 2007. Distance and Information Asymmetries in Lending Decisions. *Proceedings* (May), 183–204.
- Alessandria, G., Kaboski, J. P., Midrigan, V., 2010. The Great Trade Collapse of 2008–09: An Inventory Adjustment? NBER Working Papers 16059, National Bureau of Economic Research, Inc.
URL <http://ideas.repec.org/p/nbr/nberwo/16059.html>
- Alessandrini, P., Presbitero, A. F., Zazzaro, A., 2009. Banks, Distances and Firms' Financing Constraints. *Review of Finance* 13 (2), 261–307.
- Altomonte, C., Di Mauro, F., Ottaviano, G., Rungi, A., Vicard, V., 2011. Global Value Chains during the Great Trade Collapse: a Bullwhip Effect. Paolo Baffi Centre Research Paper.
- Amiti, M., Weinstein, D. E., 2009. Exports and Financial Shocks. NBER Working Papers 15556, National Bureau of Economic Research, Inc.
- Angelini, P., Di Salvo, R., Ferri, G., 1998. Availability and Cost of Credit for Small Businesses: Customer Relationships and Credit Cooperatives. *Journal of Banking & Finance* 22 (6–8), 925–954.
- Beck, T., Demirgüç-Kunt, A., Pería, M., 2011. Bank Financing for SMEs: Evidence Across Countries and Bank Ownership Types. *Journal of Financial Services Research* 39 (1), 35–54.
- Békés, G., Halpern, L., Koren, M., Muraközy, B., 2012. How Did Exporting Firms Cope with the Crisis? EFIGE country report Hungary, Brussels.
- Berger, A. N., Black, L. K., 2011. Bank Size, Lending Technologies, and Small Business Finance. *Journal of Banking & Finance* 35 (3), 724–735.
- 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 (2), 237–269.
- Berger, A. N., Udell, G. F., 1995. Relationship Lending and Lines of Credit in Small Firm Finance. *Journal of Business* 68 (3), 351–81.
- Bernard, A. B., Eaton, J., Jensen, J. B., Kortum, S., 2003. Plants and Productivity in International Trade. *American Economic Review* 93 (4), 1268–1290.
- Bernard, A. B., Jensen, J. B., 1999. Exceptional Exporter Performance: Cause, Effect, or Both? *Journal of International Economics* 47 (1), 1–25.
- Boot, A. W. A., 2000. Relationship Banking: What Do We Know? *Journal of Financial Intermediation* 9 (1), 7–25.
- Brevoort, K. P., Hannan, T. H., 2006. Commercial Lending and Distance: Evidence from Community Reinvestment Act Data. *Journal of Money, Credit, and Banking* 38 (8), 1991–2012.

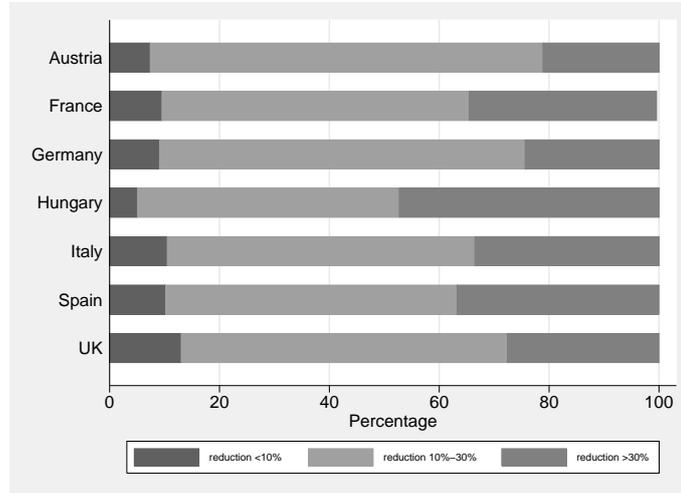
- Bricongne, J.-C., Fontagné, L., Gaulier, G., Taglioni, D., Vicard, V., 2012. Firms and the Global Crisis: French Exports in the Turmoil. *Journal of International Economics* 87 (1), 134–146.
- Bronzini, R., D’Ignazio, A., 2011. Financial Constraints and Export Performance: Firm Evidence from Italy. Working paper, Bank of Italy.
- Buch, C. M., 2005. Distance and International Banking. *Review of International Economics* 13 (4), 787–804.
- Campello, M., Graham, J. R., Harvey, C. R., 2010. The Real Effects of Financial Constraints: Evidence from a Financial Crisis. *Journal of Financial Economics* 97 (3), 470–487.
- Cappiello, L., Kadareja, A., Sørensen, C. K., Protopapa, M., 2010. Do Bank Loans and Credit Standards Have an Effect on Output? A Panel Approach for the Euro Area. Working Paper Series 1150, European Central Bank.
- Casolaro, L., Mistrullia, P. E., 2008. Distance, Lending Technologies and Interest Rates. 21st australasian finance and banking conference 2008 paper.
- 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 (1), 117–133.
- Cole, R. A., Goldberg, L. G., White, L. J., 2004. Cookie Cutter vs. Character: The Micro Structure of Small Business Lending by Large and Small Banks. *Journal of Financial and Quantitative Analysis* 39 (02), 227–251.
- Degryse, H., Kim, M., Ongena, S., 2009. *Microeconometrics of Banking Methods, Applications, and Results*. Oxford University Press.
- Dell’Ariccia, G., Detragiache, E., Rajan, R., 2008. The Real Effect of Banking Crises. *Journal of Financial Intermediation* 17 (1), 89–112.
- Elyasiani, E., Goldberg, L. G., 2004. Relationship Lending: A Survey of the Literature. *Journal of Economics and Business* 56 (4), 315–330.
- Feenstra, R. C., Li, Z., Yu, M., 2011. Exports and Credit Constraints Under Incomplete Information: Theory and Evidence from China. NBER Working Papers 16940, National Bureau of Economic Research, Inc.
- Fisman, R., Paravisini, D., Vig, V., September 2011. Lender-Borrower Cultural Proximity and Loan Outcomes: Evidence from an Indian Bank. Working paper, Columbia Business School.
- Gobbi, G., Sette, E., 2012. Relationship lending in a financial turmoil. Mo.Fi.R. Working Papers 59, Money and Finance Research group (Mo.Fi.R.) - Univ. Politecnica Marche - Dept. Economic and Social Sciences.
- Harhoff, D., Körting, T., 1998. Lending Relationships in Germany: Empirical Results from Survey Data. *Journal of Banking and Finance* 22 (10-11), 1317–1353.
- Hauswald, R., Marquez, R., 2006. Competition and Strategic Information Acquisition in Credit Markets. *Review of Financial Studies* 19 (3), 967–1000.

- Heckman, J. J., 1979. Sample Selection Bias as a Specification Error. *Econometrica* 47 (1), 153–61.
- Herrera, A. M., Minetti, R., 2007. Informed Finance and Technological Change: Evidence from Credit Relationships. *Journal of Financial Economics* 83 (1), 223–269.
- Jiangli, W., Unal, H., Yom, C., 2008. Relationship Lending, Accounting Disclosure, and Credit Availability during the Asian Financial Crisis. *Journal of Money, Credit and Banking* 40 (1), 25–55.
- Jiménez, G., Salas, V., Saurina, J., 2009. Organizational Distance and Use of Collateral for Business Loans. *Journal of Banking & Finance* 33 (2), 234–243.
- Liberti, J. M., Mian, A. R., 2009. Estimating the Effect of Hierarchies on Information Use. *Review of Financial Studies* 22 (10), 4057–4090.
- Mayer, C., 1988. New Issues in Corporate Finance. *European Economic Review* 32 (5), 1167–1183.
- Melitz, M. J., November 2003. The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71 (6), 1695–1725.
- Mian, A., 06 2006. Distance Constraints: The Limits of Foreign Lending in Poor Economies. *Journal of Finance* 61 (3), 1465–1505.
- Mitri, S. D., Gobbi, G., Sette, E., Sep. 2010. Relationship Lending in a Financial Turmoil. *Temi di discussione (Economic working papers)* 772, Bank of Italy, Economic Research Department.
- Neugebauer, K., Spies, J., 2012. How Did Exporting Firms Cope with the Crisis? EFIGE country report Germany, Brussels.
- Nilsen, J. H., 2002. Trade Credit and the Bank Lending Channel. *Journal of Money, Credit and Banking* 34 (1), 226–53.
- Papke, L. E., Wooldridge, J. M., 1996. Econometric Methods for Fractional Response Variables with an Application to 401(K) Plan Participation Rates. *Journal of Applied Econometrics* 11 (6), 619–32.
- Paravisini, D., Rappoport, V., Schnabl, P., Wolfenzon, D., 2011. Dissecting the Effect of Credit Supply on Trade: Evidence from Matched Credit-Export Data. NBER Working Papers 16975, National Bureau of Economic Research, Inc.
- Petersen, M., Rajan, R., May 1995. The Effect of Credit Market Competition on Lending Relationships. *The Quarterly Journal of Economics* 110 (2), 407– 443.
- Petersen, M. A., Rajan, R. G., 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. *Journal of Finance* 49 (1), 3–37.
- Petersen, M. A., Rajan, R. G., 2002. Does Distance Still Matter? The Information Revolution in Small Business Lending. *Journal of Finance* 57 (6), 2533–2570.
- Puri, M., Rocholl, J., Steffen, S., 2011. Global Retail Lending in the Aftermath of the US Financial Crisis: Distinguishing between Supply and Demand Effects. *Journal of Financial Economics* 100 (3), 556–578.

Van de Ven, W. P. M. M., Van Praag, B. M. S., 1981. The Demand for Deductibles in Private Health Insurance: A Probit Model with Sample Selection. *Journal of Econometrics* 17 (2), 229–252.

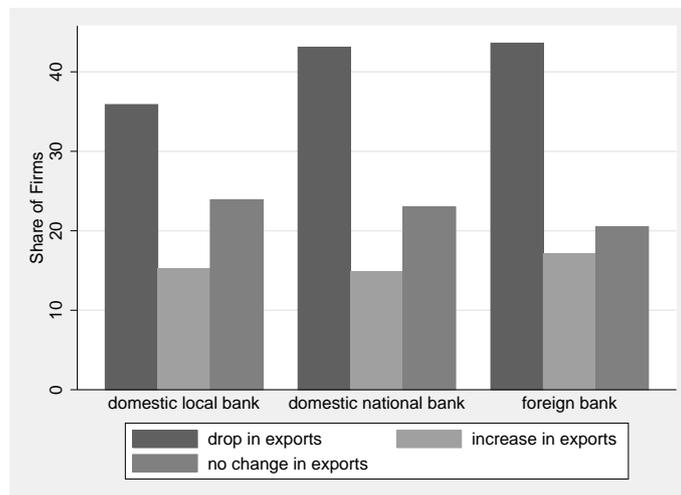
Figures and Tables

Figure 1: Export Reductions by Firm Nationality



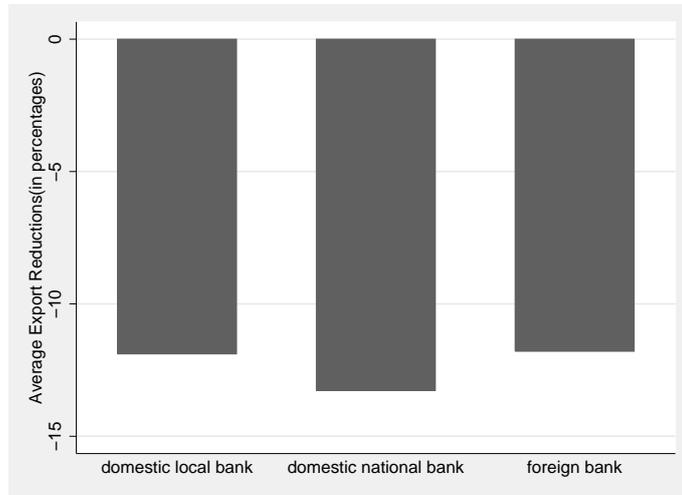
Source: Own calculations, data from EFIGE Survey.

Figure 2: Export Performance and Bank-Firm Distance



Source: Own calculations, data from EFIGE Survey.

Figure 3: Net Change in Exports by Bank Type



Source: Own calculations, data from EFIGE Survey.

Table 1: Bivariate Probit Selection Model of Export Performance and Bank Type with Sectoral Dependence on External Finance: The Extensive Margin

This Table reports the results for a bivariate probit model with selection. It controls for sectoral dependence on external finance. The dependent variable is a dummy variable indicating whether a company experienced a reduction in exports in 2009 as compared to 2008. Note that we do not report marginal effects in this table. In columns 1, 4 and 7, we measure the impact of sectoral dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for sectoral dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Standard errors are clustered at the level of country sectors and are robust to heteroskedasticity. Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.046 (0.284)	0.006 (0.288)	43.099*** (11.483)	-0.048 (0.287)	-0.123 (0.294)	42.608*** (11.403)	0.017 (0.286)	0.012 (0.288)	42.978*** (11.560)
dep_k	0.059*** (0.012)	0.075*** (0.013)	0.076*** (0.013)	0.058*** (0.012)	0.088*** (0.027)	0.085*** (0.027)	0.059*** (0.012)	0.062*** (0.014)	0.064*** (0.014)
Log age			-5.669*** (1.512)			-5.619*** (1.504)			-5.653*** (1.522)
Company belonging to a group			0.015 (0.047)			0.018 (0.047)			0.016 (0.047)
Product diversification			-0.019 (0.025)			-0.018 (0.025)			-0.018 (0.025)
Log employment			0.012 (0.023)			0.012 (0.023)			0.015 (0.023)
$type_i^{local}$	-0.060 (0.039)	0.041 (0.085)	0.044 (0.087)						
$type_i^{local} \times dep_k$		-0.037 (0.030)	-0.035 (0.030)						
$type_i^{national}$				0.075* (0.039)	0.193** (0.088)	0.171** (0.086)			
$type_i^{national} \times dep_k$					-0.043 (0.028)	-0.037 (0.028)			
$type_i^{foreign}$							0.021 (0.045)	0.085 (0.125)	0.080 (0.126)
$type_i^{foreign} \times dep_k$								-0.023 (0.038)	-0.030 (0.038)
Observations	9140	9140	9120	9140	9140	9120	9140	9140	9120
ρ	-0.0175	-0.0176	-0.0207	-0.0137	-0.0161	-0.0182	-0.0178	-0.0166	-0.0224
χ^2	412.5	468.5	531.9	454.9	458.3	502.3	415.4	422.4	455.5
Log Likelihood	-192150	-192130	-191329	-192143	-192119	-191321	-192179	-192176	-191364

Table 2: Bivariate Probit Selection Model of Export Performance and Bank Type with Firm Dependence on External Finance: The Extensive Margin

This Table reports the results for a bivariate probit model with selection. It controls for firm dependence on external finance. The dependent variable is a dummy variable indicating whether a company experienced a reduction in exports in 2009 as compared to 2008. Note that we do not report marginal effects in this table. In columns 1, 4 and 7, we measure the impact of firm dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for firm dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Standard errors are clustered at the level of country sectors and are robust to heteroskedasticity. Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	0.136 (0.285)	0.134 (0.284)	41.446*** (11.419)	0.031 (0.288)	0.012 (0.288)	41.095*** (11.404)	0.104 (0.287)	0.117 (0.297)	41.055*** (11.410)
dep_i	0.171*** (0.039)	0.179*** (0.053)	0.182*** (0.054)	0.167*** (0.039)	0.244*** (0.090)	0.239*** (0.090)	0.168*** (0.039)	0.191*** (0.045)	0.191*** (0.047)
Log age			-5.432*** (1.503)			-5.402*** (1.502)			-5.384*** (1.502)
Company belonging to a group			0.019 (0.047)			0.023 (0.047)			0.020 (0.047)
Product diversification			-0.024 (0.024)			-0.023 (0.024)			-0.023 (0.024)
Log employment			0.015 (0.023)			0.014 (0.023)			0.018 (0.023)
$type_i^{local}$	-0.063 (0.039)	-0.059 (0.044)	-0.050 (0.045)						
$type_i^{local} \times dep_i$		-0.019 (0.079)	-0.024 (0.082)						
$type_i^{national}$				0.081** (0.039)	0.103*** (0.038)	0.095** (0.038)			
$type_i^{national} \times dep_i$					-0.104 (0.100)	-0.095 (0.102)			
$type_i^{foreign}$							0.026 (0.044)	0.069 (0.051)	0.042 (0.056)
$type_i^{foreign} \times dep_i$								-0.202 (0.180)	-0.194 (0.182)
Observations	9137	9137	9118	9137	9137	9118	9137	9137	9118
ρ	-0.0379	-0.0377	-0.0424	-0.0333	-0.0337	-0.0373	-0.0375	-0.0375	-0.0455
χ^2	385.3	385.0	417.7	430.0	441.9	507.2	373.6	372.7	401.8
Log Likelihood	-192118	-192117	-191332	-192107	-192094	-191310	-192149	-192123	-191335

Table 3: Two-Step Model of Export Performance and Bank Type with Sectoral Dependence on External Finance: The Intensive Margin

This Table reports the results for a Heckman selection model. It controls for sectoral dependence on external finance. The dependent variable is the share of export reduction of companies during the crisis. In columns 1, 4 and 7, we measure the impact of sectoral dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for industry dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	2.688*** (0.140)	2.711*** (0.137)	-8.005 (9.339)	2.804*** (0.145)	2.778*** (0.151)	-7.517 (9.498)	2.705*** (0.142)	2.701*** (0.144)	-7.853 (9.261)
dep_k	0.047*** (0.016)	0.038** (0.019)	0.040** (0.019)	0.048*** (0.016)	0.058*** (0.020)	0.060*** (0.020)	0.047*** (0.016)	0.049*** (0.017)	0.050*** (0.017)
Log age			1.436 (1.231)			1.376 (1.251)			1.412 (1.220)
Company belonging to a group			0.029 (0.045)			0.025 (0.044)			0.033 (0.045)
Product diversification			0.018 (0.048)			0.019 (0.047)			0.018 (0.048)
Log employment			-0.088*** (0.014)			-0.085*** (0.014)			-0.086*** (0.015)
$type_i^{local}$	0.021 (0.038)	-0.044 (0.077)	-0.056 (0.077)						
$type_i^{local} \times dep_k$		0.024 (0.026)	0.023 (0.027)						
$type_i^{national}$				-0.101*** (0.032)	-0.063 (0.074)	-0.046 (0.073)			
$type_i^{national} \times dep_k$					-0.013 (0.023)	-0.015 (0.023)			
$type_i^{foreign}$							-0.085* (0.049)	-0.033 (0.113)	-0.008 (0.113)
$type_i^{foreign} \times dep_k$								-0.019 (0.031)	-0.011 (0.031)
Observations	6536	6536	6524	6536	6536	6524	6536	6536	6524
λ	0.174	0.173	0.179	0.171	0.171	0.176	0.170	0.170	0.179
ρ	0.210	0.209	0.217	0.206	0.207	0.214	0.206	0.206	0.217
Log Likelihood	-155709	-155698	-154856	-155628	-155626	-154799	-155680	-155677	-154859

Table 4: Two-Step Model of Export Performance and Bank Type with Firm Dependence on External Finance: The Intensive Margin

This Table reports the results for a Heckman selection model. It controls for firm dependence on external finance. The dependent variable is the share of export reduction of companies during the crisis. In columns 1, 4 and 7, we measure the impact of firm dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for industry dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	2.772*** (0.124)	2.776*** (0.124)	-10.170 (9.303)	2.884*** (0.132)	2.867*** (0.134)	-9.966 (9.420)	2.789*** (0.128)	2.789*** (0.128)	-9.876 (9.250)
dep_i	0.025 (0.040)	0.007 (0.051)	0.004 (0.053)	0.026 (0.040)	0.096 (0.070)	0.099 (0.070)	0.024 (0.039)	0.026 (0.044)	0.027 (0.046)
Log age			1.730 (1.227)			1.711 (1.243)			1.691 (1.220)
Company belonging to a group			0.029 (0.044)			0.025 (0.044)			0.033 (0.045)
Product diversification			0.018 (0.050)			0.018 (0.049)			0.017 (0.051)
Log employment			-0.085*** (0.014)			-0.081*** (0.014)			-0.083*** (0.014)
$type_i^{local}$	0.018 (0.039)	0.006 (0.041)	-0.011 (0.040)						
$type_i^{local} \times dep_i$		0.045 (0.068)	0.057 (0.065)						
$type_i^{national}$				-0.097*** (0.033)	-0.074** (0.036)	-0.060* (0.035)			
$type_i^{national} \times dep_i$					-0.093 (0.079)	-0.095 (0.076)			
$type_i^{foreign}$							-0.083* (0.049)	-0.079 (0.058)	-0.038 (0.060)
$type_i^{foreign} \times dep_i$								-0.022 (0.098)	0.002 (0.097)
Observations	6534	6534	6523	6534	6534	6523	6534	6534	6523
λ	0.175	0.175	0.180	0.172	0.171	0.177	0.171	0.171	0.179
ρ	0.211	0.210	0.217	0.207	0.207	0.214	0.206	0.206	0.216
Log Likelihood	-155818	-155814	-154999	-155744	-155730	-154935	-155790	-155789	-155000

Table 5: Two-Step Model of Export Performance and Bank Type with Sectoral Dependence on External Finance: The Intensive Margin

This Table reports the results for a two-stage fractional logit model. It controls for sectoral dependence on external finance. The dependent variable is the share of export reduction of companies during the crisis. In columns 1, 4 and 7, we measure the impact of sectoral dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for industry dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-1.861** (0.783)	-1.826** (0.780)	-17.954 (24.974)	-1.727** (0.787)	-1.701** (0.797)	-17.286 (24.985)	-1.813** (0.777)	-1.825** (0.783)	-17.677 (24.880)
dep_k	0.070* (0.041)	0.057 (0.053)	0.061 (0.052)	0.071* (0.041)	0.061 (0.069)	0.067 (0.068)	0.070* (0.041)	0.075* (0.043)	0.076* (0.043)
Inverse Mills ratio	1.006 (0.686)	0.998 (0.690)	1.043 (0.717)	0.989 (0.678)	0.988 (0.679)	1.032 (0.709)	0.967 (0.677)	0.970 (0.679)	1.036 (0.713)
Log age			2.164 (3.278)			2.085 (3.280)			2.122 (3.265)
Company belonging to a group			0.014 (0.122)			0.010 (0.121)			0.022 (0.122)
Product diversification			0.043 (0.090)			0.044 (0.089)			0.043 (0.090)
Log employment			-0.162*** (0.051)			-0.160*** (0.051)			-0.157*** (0.052)
$type_i^{local}$	0.048 (0.100)	-0.040 (0.240)	-0.064 (0.237)						
$type_i^{local} \times dep_k$		0.031 (0.078)	0.030 (0.077)						
$type_i^{national}$				-0.102 (0.108)	-0.139 (0.257)	-0.104 (0.255)			
$type_i^{national} \times dep_k$					0.013 (0.082)	0.009 (0.081)			
$type_i^{foreign}$							-0.177 (0.133)	-0.039 (0.353)	0.011 (0.353)
$type_i^{foreign} \times dep_k$								-0.049 (0.112)	-0.033 (0.112)
Observations	3073	3073	3061	3073	3073	3061	3073	3073	3061
χ^2	223.5	223.4	276.2	227.6	227.2	279.5	227.5	231.0	279.9
Log Likelihood	-27947	-27944	-27661	-27938	-27938	-27657	-27931	-27929	-27659
BIC	-8682	-8679	-8848	-8699	-8692	-8856	-8713	-8710	-8852
AIC	18.21	18.21	18.10	18.20	18.20	18.09	18.20	18.20	18.10

Table 6: Two-Step Model of Export Performance and Bank Type with Firm Dependence on External Finance: The Intensive Margin

This Table reports the results for a two-stage fractional logit model. It controls for firm dependence on external finance. The dependent variable is the percentage of export reduction of companies during the crisis. In columns 1, 4 and 7, we measure the impact of firm dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for firm dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Standard errors are clustered at the level of country sectors and are robust to heteroskedasticity. Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-1.707** (0.783)	-1.702** (0.781)	-21.090 (25.145)	-1.580** (0.789)	-1.584** (0.788)	-20.587 (25.111)	-1.660** (0.779)	-1.656** (0.783)	-20.723 (24.993)
dep_i	0.066 (0.114)	0.050 (0.148)	0.044 (0.147)	0.068 (0.114)	0.082 (0.214)	0.084 (0.210)	0.065 (0.114)	0.076 (0.121)	0.076 (0.120)
Inverse Mills ratio	0.994 (0.669)	0.991 (0.670)	1.031 (0.698)	0.978 (0.661)	0.978 (0.661)	1.019 (0.690)	0.955 (0.660)	0.953 (0.661)	1.017 (0.693)
Log age			2.596 (3.300)			2.539 (3.297)			2.548 (3.281)
Company belonging to a group			0.016 (0.122)			0.012 (0.121)			0.022 (0.121)
Product diversification			0.040 (0.097)			0.040 (0.096)			0.039 (0.098)
Log employment			-0.158*** (0.051)			-0.155*** (0.051)			-0.153*** (0.052)
$type_i^{local}$	0.043 (0.101)	0.033 (0.114)	-0.001 (0.115)						
$type_i^{local} \times dep_i$		0.038 (0.228)	0.059 (0.226)						
$type_i^{national}$				-0.096 (0.109)	-0.092 (0.123)	-0.067 (0.122)			
$type_i^{national} \times dep_i$					-0.018 (0.249)	-0.019 (0.245)			
$type_i^{foreign}$							-0.173 (0.133)	-0.146 (0.152)	-0.062 (0.154)
$type_i^{foreign} \times dep_i$								-0.122 (0.307)	-0.088 (0.303)
Observations	3071	3071	3060	3071	3071	3060	3071	3071	3060
χ^2	220.4	220.5	272.1	223.2	223.6	274.7	223.4	224.1	273.3
Log Likelihood	-27979	-27978	-27704	-27971	-27971	-27699	-27963	-27962	-27701
BIC	-8579	-8572	-8744	-8595	-8587	-8753	-8610	-8605	-8750
AIC	18.24	18.24	18.13	18.24	18.24	18.13	18.23	18.23	18.13

Table 7: Two-Step Tobit Model of Export Performance and Bank Type with Sectoral Dependence on External Finance: The Intensive Margin

This Table reports the results for a two-step tobit model. It controls for sectoral dependence on external finance. The dependent variable is the share of export changes (positive and negative) of companies during the crisis. In columns 1, 4 and 7, we measure the impact of sectoral dependence on external finance, together with the type of bank used to finance foreign activities (N =local, national or foreign). In columns 2, 5 and 8, we add an interaction term for industry dependence on external finance and the type of bank used. In columns 3, 6 and 9, we include additional explanatory variables specifying the age of the company (in logs), a dummy variable indicating whether the company belongs to a group, the diversification of the company's product portfolio and employment (in logs). Significance levels are: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-0.006 (0.115)	-0.015 (0.115)	-8.266*** (2.984)	-0.006 (0.116)	0.029 (0.118)	-8.156*** (2.968)	-0.012 (0.115)	-0.005 (0.116)	-8.247*** (2.984)
dep_k	-0.013** (0.005)	-0.010 (0.007)	-0.011 (0.007)	-0.013** (0.005)	-0.027*** (0.010)	-0.028*** (0.010)	-0.013** (0.005)	-0.016*** (0.006)	-0.017*** (0.006)
Inverse Mills ratio	-0.102* (0.061)	-0.100* (0.061)	-0.113* (0.062)	-0.102* (0.061)	-0.101* (0.061)	-0.114* (0.062)	-0.095 (0.061)	-0.095 (0.061)	-0.109* (0.062)
Log age			1.080*** (0.392)			1.072*** (0.390)			1.080*** (0.392)
Company belonging to a group			-0.018 (0.015)			-0.018 (0.015)			-0.020 (0.015)
Product diversification			-0.003 (0.006)			-0.003 (0.006)			-0.003 (0.006)
Log employment			0.022*** (0.006)			0.022*** (0.006)			0.020*** (0.006)
$type_i^{local}$	0.001 (0.013)	0.024 (0.031)	0.027 (0.031)						
$type_i^{local} \times dep_k$		-0.008 (0.010)	-0.008 (0.010)						
$type_i^{national}$				-0.000 (0.015)	-0.054 (0.034)	-0.056 (0.034)			
$type_i^{national} \times dep_k$					0.019* (0.011)	0.019* (0.011)			
$type_i^{foreign}$							0.033* (0.017)	-0.027 (0.042)	-0.027 (0.042)
$type_i^{foreign} \times dep_k$								0.021 (0.014)	0.020 (0.014)
Observations	4070	4070	4058	4070	4070	4058	4070	4070	4058
F Statistic	6.143	5.943	5.716	6.163	6.032	5.781	6.250	6.119	5.855
Pseudo-R ²	0.0532	0.0535	0.0571	0.0532	0.0543	0.0580	0.0542	0.0548	0.0581
Log Likelihood	-34965	-34957	-34792	-34965	-34926	-34761	-34931	-34907	-34758