Credit contraction and international trade: Evidence from Chilean exporters

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Summary. — Using data of Chilean exporting firms, this paper studies the effect of the financial crisis on the extensive and intensive margin of export in the aftermath of the crisis. The negative effect of the crisis on exports is highly heterogeneous. The evidence shows that larger exporters, belonging to industries more dependent on overall credit, have suffered disproportionately more during the crisis in terms of export growth, but less in terms of entry and exit. This has important policy implications, as public policy aiming at stimulating trade credit may not be as effective if overarching credit conditions remain subdued.
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1. INTRODUCTION

As a consequence of the recent financial crisis there was a notable reduction in global trade. According to the World Bank (2010), the value of world trade plummeted 31% between August 2008 and its low point in March 2009.[1] There has been a debate over the reasons for such a spectacular fall in global trade. Among the probable culprits, three stand out: (i) economic recession, (ii) credit contraction, and (iii) increased protectionism. Since protectionism seems to be more a consequence rather than a cause of the falling trade, as argued in Baldwin and Evenett (2009), the first two are the most plausible causes for the trade collapse.

This paper explores the role credit constraints played during the crisis. Using a detailed dataset with monthly observations covering all Chilean exporters during the period 2006–09, we investigate how firms' characteristics (size, industry, financing dependence, and export credit) affected the magnitude of export contraction during the recent financial crisis. We also explore how different margins responded to the financial crisis. In particular, we analyze how firm export growth (the intensive margin) and entry and exit rates (extensive margin) were affected during the crisis and whether this impact was different depending on the financial needs of the industries.

We introduce a novel measure of export credit dependence using direct information on the share of exports that are credit paid. This measure is contrasted with more indirect ones such as Rajan and Zingales' (1998) external financing dependence measure.[2] Comparing how firms in industries differing in

financing and export credit dependence were affected during the crisis allows us to determine the type of credit constraint that most negatively affects international trade. We also examine whether smaller exporters—who are potentially more exposed to credit constraints—are more affected during the crisis in those sectors where export credit is more important. This is, in spirit, similar to the identification strategy developed by Rajan and Zingales (1998), who show that financial development affects industry growth more positively in those industries that are—for some technological reasons—more dependent on external finance.[3]

Our analysis of Chilean data reveals several interesting stylized facts on export growth during the last financial crisis. First, export contraction was significant and generalized across firms, market destinations, and sectors. Second, a large proportion of the Chilean export variation during 2008–09 can be attributed to the intensive (as opposed to extensive) margin. Third, we find that larger exporting firms were more negatively

affected than smaller ones during the crisis, independently if they belong to an industry with high or low financial/trade credit dependence. Finally, a noteworthy and unique result is related to export financing. Our results suggest that overall credit (not specific to international trade) was economically more important, and that larger firms in industries more dependent on overall credit were more negatively affected during the recent crisis in terms of export growth (intensive margin). However, we do not find evidence that entry and exit (extensive margin) in those industries were specially affected during the financial crisis. In contrast to results for export growth that suggest that large exporters were more affected by the financial crisis, we find that smaller exporters experienced lower entry and higher exit during the crisis. These results indicate that export contraction was heterogeneous across exporter size, industry credit and financial dependence, and export margins.

This study contributes to the recent literature on the factors explaining the trade collapse. More evidence on this regard is relevant because there is no consensus on the role of financial constraints in explaining trade performance. Amiti and Weinstein (2011) find that trade finance constraints account for one-third of the decline in Japanese exports in the financial crises of the 1990s. In the same vein, and using data on French exports, Bricongne, Fontagne, Gaulier, Taglioni, and Vicard (2012) find that firms (large and small) in industries structurally more dependent on external finance fared worse during the recent crisis. Chor and Manova (2012), using monthly data from 2007 to 2009, find a role for overall credit conditions in explaining the pattern of cross-country, cross-industry exports to the United States. Rappoport, Paravisini, Wolfenzon, and Schnabl (2011) find that credit constraints channel explain 15% of the Peruvian exports decline during the crisis. Conversely, Levchenko, Lewis, and Tesar (2010), using data on US imports and exports, find no support for the hypothesis that trade credit played a significant role in the recent trade collapse. Eaton, Kortum, Neiman, and Romalis (2010) suggest that the relative decline in demand for manufactures was the most important driver of the decline in worldwide manufacturing trade.

Another contribution of this study derives directly from the wealth of our dataset which allows us to construct a direct measure of industry dependence on export credit, a relevant piece of analysis not contemplated in the articles mentioned above. Finally, there are some studies exploring the issue of export decisions and financing (Greenaway, Guaruglia, & Kneller 2007), but questions relate more to issues such as what type of firms have access to credit and whether credit access facilitates exports. To the best of our knowledge, there is no previous evidence on how exporters finance exports and how they respond to changes in domestic and trade-related credit conditions.

The paper continues as follows: Section 2 describes the dataset with emphasis on some stylized facts; Section 3 presents the empirical methodology; Section 4 shows the econometric results; and Section 5 concludes the paper.

2. DATA AND STYLIZED FACTS

This study uses a detailed firm-level dataset with monthly information on exports by product (at the eight-digit level of the Harmonized System) and destination country for all Chilean exporting firms between 2006M1 and 2009M12. The data are collected by customs and covers all exporting firms during the period. This paper uses only information for all non-

copper products based on the Harmonized System (HS) classification. For each year the dataset contains exports by firm, destination, and product.

We first show some stylized facts on the export performance of the Chilean economy during the crisis. Similar to the experience of other economies, Chile experienced a large trade contraction during 2008–09 financial crisis (Table 1). The annual average fall in Chilean trade was 22.6%, a comparable figure to what happened to world, advanced, and developing countries' international trade. For all these groups, the magnitude of the reduction was around 20%. Then, with the exception of some countries such as Colombia, Paraguay, and Uruguay, the case of Chile is not an isolated phenomenon.

As we concentrate in non-copper exports in the empirical part of the paper, we discuss the evolution of those exports below.[4] Figure 1 shows the evolution of Chilean exports since 2006 to December of 2009. After almost three years of consistent positive growth, the Chilean exports collapsed starting in September 2008. The average annual nominal exports growth in the period previous to the crisis (2006M1–2008M9) was 18.4% and, between 2008M10 and 2009M12, this average growth was −21.4%.

The export contraction was generalized across destination markets and increased significantly over time. Figure 2 shows the evolution of the distribution of annual export growth over time. As it can be appreciated, during the first months of the crisis, the distribution of export growth is even between expansions and contractions. As the crisis evolved, the evidence shows that exports contracted in most of destination countries.

This strong fall in exports was also generalized across industries.[5] Before the crisis, the percentage of industries with negative export growth was between 20% and 40%. As the crisis evolved, this percentage increased rapidly, reaching almost each export sector (Figure 3). Note that during 2009, the percentage of industries with negative export growth was close to 100%. At the end of that year, there was a reduction in this indicator which is consistent with a slow recovery in international trade. Note, however, that at the end of 2009 annual export growth of Chilean exports is still negative (Figure 1).

Similar evidence is found when looking at firms. The number of firms with negative export growth increased from about 40% of total exporters before the crisis up to more that 60% in the third quarter of 2009. The negative effect of the crisis is generalized to both large and small exporters. However, it seems that large exporters—those in the third and fourth quartiles of the industry export size distribution—were most affected by the crisis. The increase in the percentage of firms with negative growth is more pronounced in those exporters (Figure 4).

Given that we have information on exports by product and markets, we can explore how the negative impact of the crisis affected these different margins. We follow Bernard, Jensen, Redding, and Schott (2009) and decompose the aggregate Chilean noncopper trade with partner country c in period t (x_t^c) in the number of firms that trade with the country (f_t^c), the number of products traded with the country (p_t^c), and the average value of trade per firm-product, $\bar{x}_t^c = x_t^c/(f_t^c p_t^c)$. Thus, total trade to country c in each period is simply the product between the number of unique trading firms, the number of unique products traded, and the average value of noncopper exports:

$$x_t^c = f_t^c p_t^c \bar{x}_t^c$$

or in logarithms

Table 1. *Trade variation – international comparison (annual change, %).*
Source: Direction of Trade (IMF) and author's calculations

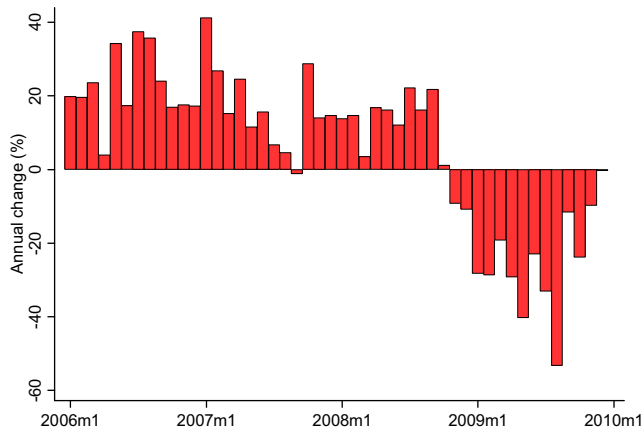|	2008m1–2008m9	2008m10–2009m12
World	24.53	−20.23
Advanced economies	19.27	−20.07
Developing countries	34.31	−20.49
Developing Asia	23.59	−14.17
Developing Europe	48.23	−28.36
Middle East & North Africa	50.11	−24.12
Sub-Saharan Africa	50.73	−28.22
Western Hemisphere	22.35	−15.35
Chile	**10.27**	**−22.62**

Figure 1. *Annual change in Chilean exports, 2006m1–2009m12. Note: Non-copper exports. Source: Central Bank of Chile.*

$$\tilde{x}_t^c = \tilde{f}_t^c + \tilde{p}_t^c + \tilde{\tilde{x}}_t^c,$$

where $\tilde{y}_t = \log(y_t)$. The above equation is the basis for the annual variation decomposition of Chilean noncopper trade, $\Delta \tilde{x}_t^c = \Delta \tilde{f}_t^c + \Delta \tilde{p}_t^c + \Delta \tilde{\tilde{x}}_t^c$, where $\Delta \tilde{f}_t^c \equiv \tilde{f}_t^c - \tilde{f}_{t-1}^c$ and $\Delta \tilde{p}_t^c \equiv \tilde{p}_t^c - \tilde{p}_{t-1}^c$ reflects annual changes due to the extensive margin and $\Delta \tilde{\tilde{x}}_t^c = \tilde{\tilde{x}}_t^c - \tilde{\tilde{x}}_{t-1}^c$ due to the intensive margin. As shown in Figure 5 and Table 2, the intensive margin explains most of Chilean export variation during 2008–09.

Our data show that, previous to the crisis, the intensive margin accounted for almost 80% of total annual change in overall Chilean exports across destinations. In the crisis period (2008m10–2009m12), this figure drops dramatically to around 57%, but remains important. The number of firms and products (the extensive margin), in turn, explains roughly 20% and 23% of total variation, respectively. In the next sections, we explore the effects of the financial crisis on both the intensive margin and the extensive margin.

3. EMPIRICAL APPROACH

Given that several prior studies have emphasized the potential importance of credit driver on trade contraction, our empirical methodology is aimed to identify how the impact of crisis on Chilean exporters depends on assumed exogenous sector-specific differences in exposure to overall financing needs and export financing. For the intensive margin, we estimate the following equation:

$$g_{fcit} = \alpha_{ct} + \alpha_{it} + \delta_1 Size_{fcit} + \delta_2 Size_{fcit} Crisis_t + \delta_3 Size_{fcit} ECredit_i$$
$$+ \delta_4 Size_{fcit} ECredit_i Crisis_t + \delta_5 Size_{fcit} FinDep_i$$
$$+ \delta_6 Size_{fcit} FinDep_i Crisis_t + \varepsilon_{fcit},$$

where the dependent variable g_{fcit} is the mid-point growth rate of firm's f export value to country destination c in a 3-digit ISIC industry i in month t. This variable is defined as: $g_{fcit} = \frac{(x_{fcit} - x_{fci(t-12)})}{(x_{fcit} + x_{fci(t-12)})/2}$, where x is the export value. [6]

To look at the impact of the financial crisis on the extensive margin, we use a different specification. We calculate yearly entry and exit rates by exporter size, country, and industry. We chose this procedure by two main reasons. First, we can control for time varying industry and country shocks more properly than in a nonlinear model such as a probit for the probability of exit. Moreover, as we do not know the total sample of potential exporters, the entry would not be defined if we want to explore how the financial crisis reduced the probability of entering into international markets. Second, by using annual data, we avoid problems associated with how to define entry and exit with monthly data. The main concern arises when a firm exported in some month of the previous year, but it does not export the same month in current year. We can define that as exit, but it can be possible that the firm appears exporting a later month of the current year. In the case of annual data, we can look at the effect of the crisis in simpler way. Exit in year 2008 (2009) is defined for firms that exported any month of year 2007 (2008), but they did not export in any month of 2008 (2009). Similarly, entry in year 2008 (2009) is defined for firms that did not export in any month of 2007 (2008), but they exported is some month of 2008 (2009).

Following these definitions, we estimate the following equation for each quartile of the exporter size distribution:

$$R_{cit} = \alpha_{ct} + \alpha_{it} + \lambda_1 Crisis_t + \lambda_2 ECredit_i Crisis_t$$
$$+ \lambda_3 FinDep_i Crisis_t + \varepsilon_{cit},$$

where R is, alternatively, the entry and exit rates defined as the number of entrants (quitters) in t divided by the average number of exporters in t and $t-1$ for each 3-digit industry, country, and size. We estimate separate regressions for each size quartile.

In both equations, the variable $ECredit_i$ is our measure of export credit dependence, $FinDep_i$ is the measure of financing dependence developed by Rajan and Zingales (1998), and $Size_{fcit}$ is a variable for initial size defined as the export share of exports of firm f in each 3-digit industry. In the case of the equation for monthly export growth, $Crisis_t$ is a dummy variable for the period [7] between 2008M9 and 2009M12. For estimating annual entry and exit rates, $Crisis_t$ is a set of two dummy variables corresponding to years 2008 and 2009. We do not define one crisis dummy because the staring date of the crisis takes some part of the year 2009. With this specification we can explore in which year the financial crisis had a more pronounced effect on entry and exit. [8]

As previously mentioned, one intended contribution of this paper is the introduction of a sector-specific measure of export credit dependence to capture the potential effects of credit constraints that are specific to international transactions. Selling in international markets generate higher credit risk coming from the uncertainty over the timing of payments between exporters and importers. The former wants to receive the payment as soon as an order is placed or before goods are sent to destination. This payment mechanism is known as *Cash-in-Advance* and it avoids credit risk of exporters since payment
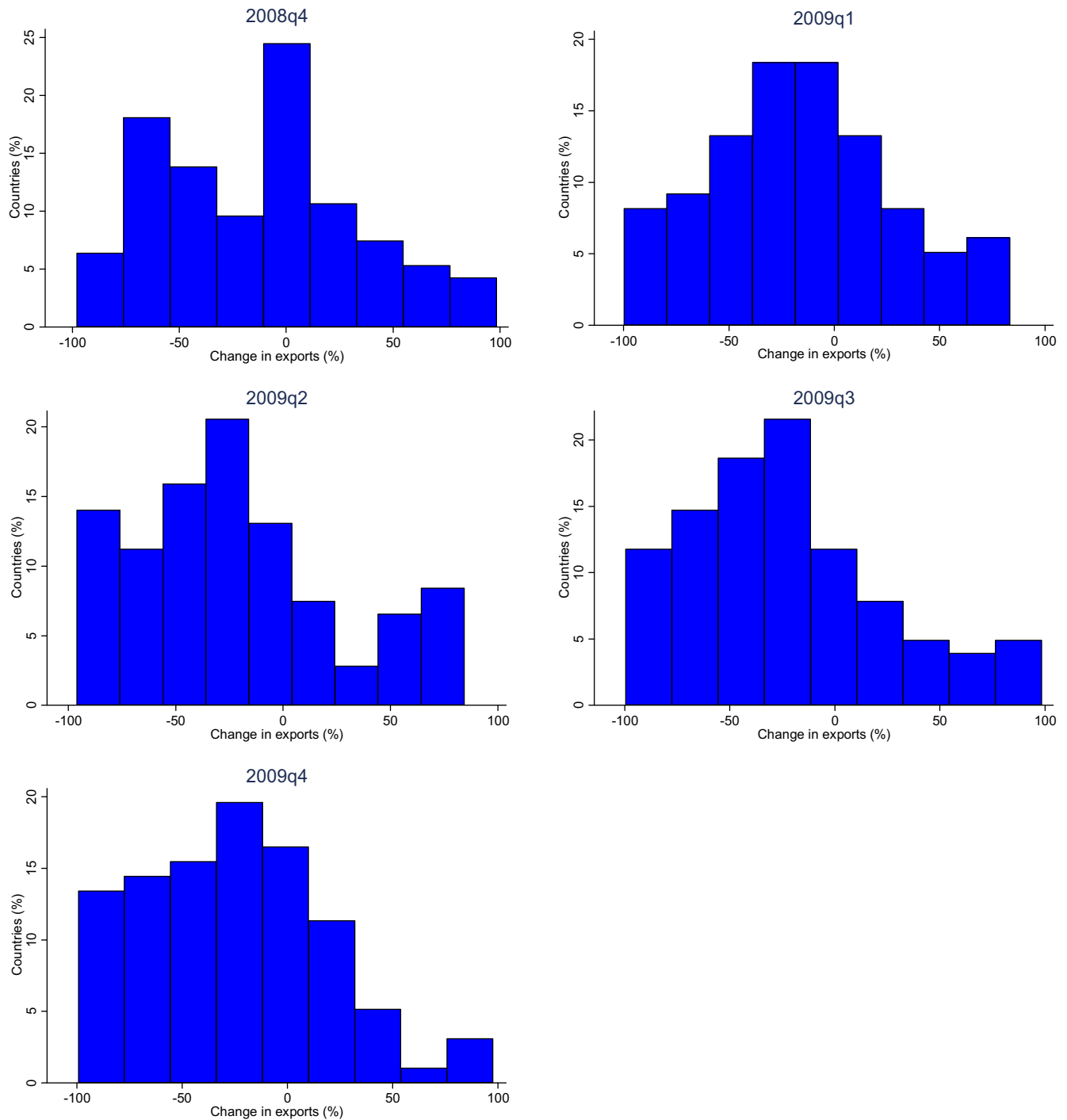
Figure 2. *Distribution of annual trade change by country. Note: Non-copper exports. Central Bank of Chile, own calculations.*

is commonly received via wire transfers and/or credit cards before the ownership of the goods is transferred. [9]

Importers, by contrast, want to receive the goods as soon as possible and to delay the payment as long as possible, in order to avoid credit risk of importers. This payment mechanism is known as *Open Account* and it corresponds to a sale where goods are shipped and delivered 30–90 days before payment is made. Because of the increasing competition in export markets, importers often press exporters for open account terms since the extension of credit by the seller to the buyer is com-

mon. However, exporters in this case can mitigate credit risk by using the export credit insurance. [10]

A payment mechanism that spreads credit risk between exporter and importer when reliable credit information is difficult to obtain is the *Letter of Credit* (LC). An LC is commitment by a bank on behalf of the importer that a payment will be made to the exporter, provided that the terms and conditions stated in the contract have been met. In this sense, LCs are one of the most secure instruments available to international traders.
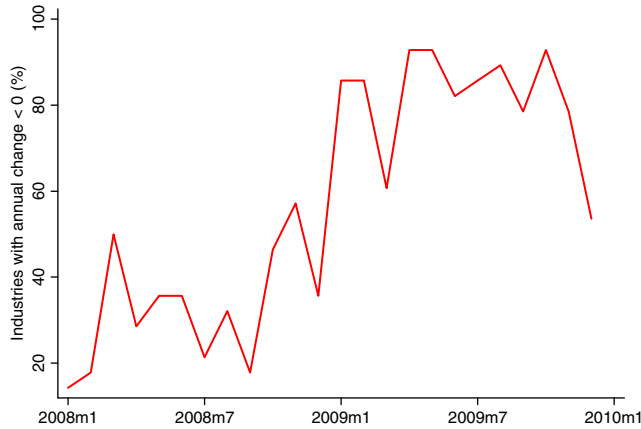
Figure 3. *Evolution of distribution of annual change in Chilean exports by industry, 2008m1–2009m12. Note: Non-copper exports. Source: Central Bank of Chile, own calculations.*
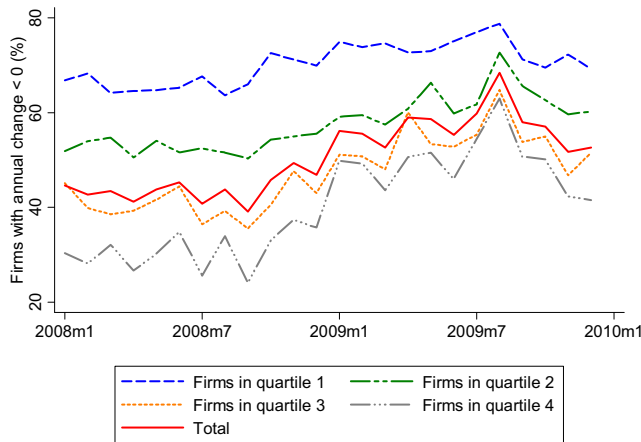

Figure 4. *Evolution of distribution of annual change in Chilean exports by size, 2008m1–2009m12. Note: Non-copper exports. Size is measured in terms of sectoral non-copper exports distribution. Source: Central Bank of Chile, own calculations.*
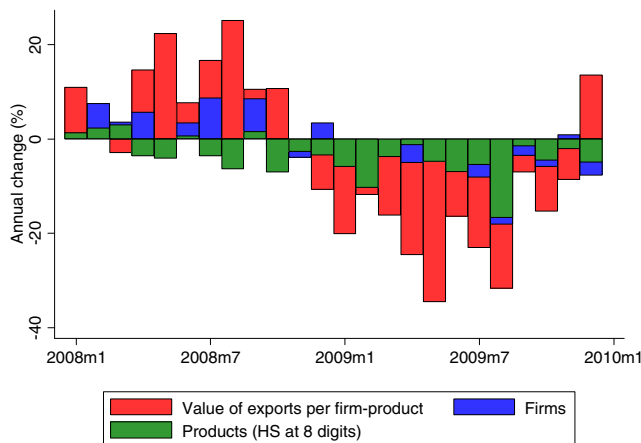

Figure 5. *Decomposition of annual change in Chilean exports, 2008m1–2009m12. Note: Non-copper exports. Source: Central Bank of Chile, own calculations.*

Finally, when exporters and importers have established trade relationships and/or they operate in stable export markets, an alternative payment mechanism is available: the

Documentary Collection (DC). A DC is a transaction whereby the exporter entrusts the collection of a payment to its bank (remitting bank), which sends the documents to the importers' bank (collecting bank) along with instructions for payment. It is important to note that although both remitting and collecting banks act as facilitators, a DC offers no verification process and limited recourse in the event of nonpayment, and so is riskier for exporters, though is more convenient and cheaper than LC to importers.

As the Chilean trade statistics register the type of payment for each export transaction, we compute for each 3-digit industry the proportion of its exports financed through trade credit. This is computed as:

$$ECredit_i = \frac{\sum_{t=2000}^{2006} \sum_{e=1}^{n} X_e * D_e^C}{\sum_{t=2000}^{2006} \sum_{e=1}^{n} X_e},$$

where X_e is the export value of transaction e in industry i, and D_e^C is a dummy variable if the transaction is paid at credit. This variable is the average—across time before the crisis and across transaction within an industry— share of exports sold at credit. We use only the information before the crisis to get rid of potential changes in export credit that can be induced by financial conditions during this crisis.

We argue that, for some reasons related to product characteristics, there are some industries in which credit in foreign sales is more important than others. For example, uncertainty in the quality of products can make purchases at credit the preferred option for importers. Additional reasons may be supply driven. For example, large domestic exporters in some industries can have better access to local credit markets than small exporters in other industries. Then, industries where larger exporters are prevalent may be more able to sell at credit. In any of these cases, we should expect to find significant differences in the prevalence of credit across industries. This is effectively the case for Chilean industries. In some sectors, such as tobacco (314 according to ISIC) and beverages (313), almost 100% of exports have been sold at credit during the period 2000–2006. In contrast, the importance of credit in exports of transport equipment (384) and miscellaneous manufactures (390) is about 80% and 65%, respectively (Figure 6).

During the crisis 2008–09, this variable does not show significant changes at the aggregate level. The percentage of exports that are sold at credit has been about 95% since the year 2003 (Figure 7). In terms of transactions, the evidence is similar. About 70% of exports transactions are paid at credit. This percentage was also stable in the crisis years. However, there are also some differences across industries. On average during the period 2000–09, about 90% of export transactions were paid at credit in industries such as petroleum refineries (353) and tobacco (314). In contrast, for professional and scientific equipment (385) and transport equipment (384) the percentages of exports sold at credit are 46.1% and 27.2%, respectively.

Comparing the pre and post-period crisis, the evidence suggests that several industries suffered a contraction in the importance of export credit. This is the case of miscellaneous manufactured products (390), non-ferrous metals (372), and printing and publishing (342) with reductions close to 10% points in the share of exports that are credit paid. The evidence would be consistent with the idea that financial frictions had an effect of the ability of firms for selling at credit, but this negative effect varies across industries. Nevertheless, the ranking of industries does not seem to be affected largely. As it is shown in Figure 8, those industries that were mode dependent in export credit before the crisis (2000–2006) persist to be also more dependent on this credit during the crisis (2008–09).

Table 2. *Decomposition of Chilean trade variation (annual change, %)*

	2008m1–2008m9	2008m10–2009m12.
Total trade	15.26	−21.37
Firms	4.12	−4.24
Products	−1.00	−4.98
Value of exports	12.14	−12.15

Note: Non-copper exports.

In measuring the industry-specific dependence on external (to the firm) resources, the indicator developed by Rajan and Zingales (1998) captures differences in financing needs that are unrelated to international trade credit. Figure 9 shows that both measures are negatively correlated, but the correlation is not high. [11] For testing which credit constraints were more relevant during the crisis, we therefore include in our regressions the same interaction variables using both measures of financing dependence.

Since a theoretical point of view both measures intend to capture complementary credit constraints. Our measure of export credit reflects how much of exports are sold at credit and it is specific to international transactions. In those industries that are more dependent on this type of financing, it should be expected that exporters face more difficulties for financing exports during a credit crunch. In the case of the financial dependence measure of Rajan and Zingales (1998), it captures more general credit dependence that it is not tightly linked to exports. Then, the effect of the crisis on exports would be more linked to financial constraints that affect the ability of firms to finance their overall operations or investments. These are not necessarily linked to exporting, but it can have an effect on export decisions. Indeed, it can be the case that some industries are highly ranked in terms of export credit, but are they are less dependent on external finance. This is illustrated in Figure 9 with the case of industries such as pottery (361) and non-ferrous metals (372).

The introduction of size as explanatory variable in the equation for export growth allows us to control for differences
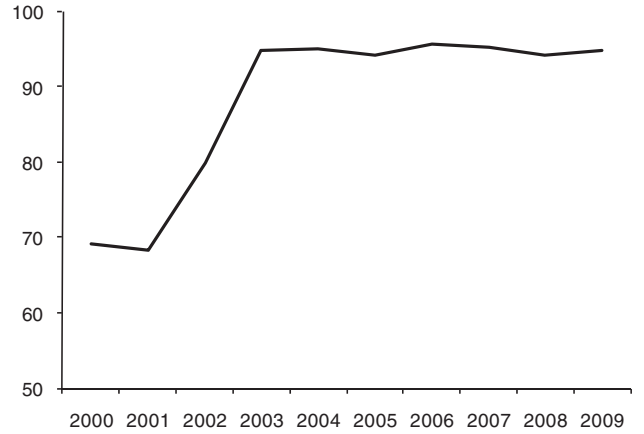

Figure 7. *Evolution of export credit, 2003–2009 (exports sold at credit over non-copper exports).*

attributable to the initial size of the exporter. It can be argued that smaller exporters have more space to expand exports, if so, initial size would be negatively correlated with export growth. In this specification, initial size is computed as the average size considering monthly exports in t and $t − 12$. In our robustness checks, we define size using exports lagged two years ($t − 24$) for dealing with endogeneity concerns.

Similarly to Bricongne *et al.* (2012), our definition of size is relative to the industry. This is preferred to absolute size, because the same amount of exports may be smaller or larger depending on the size of other exporters in the same industry. In contrast to those authors, we use a continuous variable instead of dummy variables by export size for two main reasons. Regarding the interaction between crisis and size, its inclusion allows us to analyze whether the financial crisis had lower or larger effects on export growth of smaller or larger. We are particularly interested in investigating if smaller firms in those industries more dependent on credit are specially affected during the crisis. This is captured by the interaction
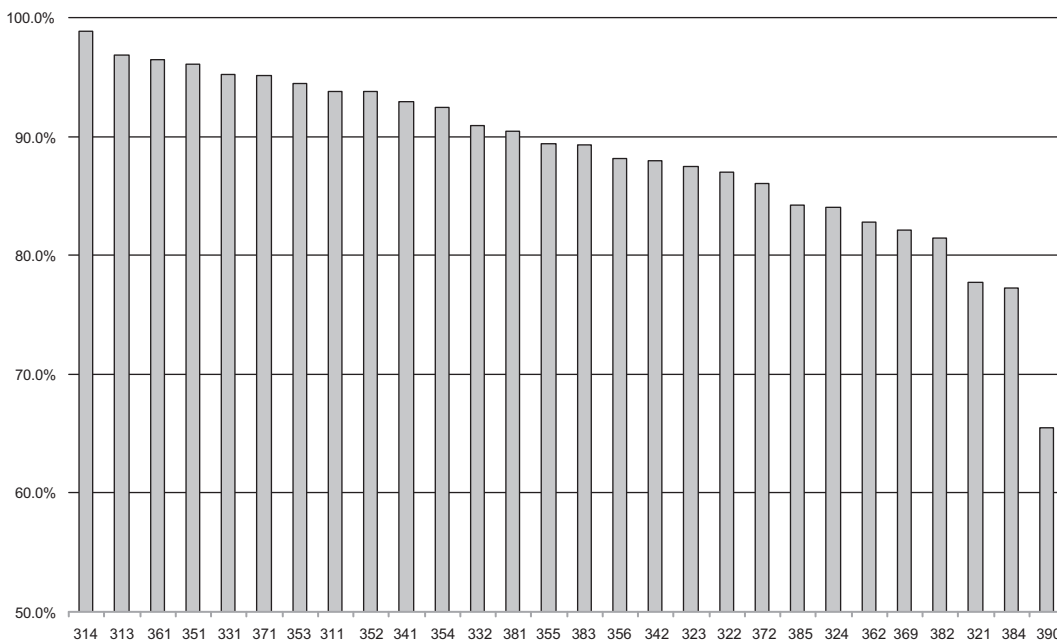

Figure 6. *Export credit by industries. Source: Central Bank of Chile, own calculations.*

between exporter size, crisis, and our measures of credit dependence. If larger exporters were negatively affected during the crisis in industries more dependent on international trade credit and overall financing, the parameters of these interactions (δ_4 and δ_6) would be negative.

For entry and exit rates, as we calculate them by industry and country, we look at the effect of financial crisis estimating the equation by quartiles of the relative size distribution. This allows us to analyze whether entry and exit rate of smaller or larger exporters were more affected by the financial crisis. We also introduce interaction terms between crisis and our measures of financial and export credit dependence to look at the differential effect of the financial crisis on entry and exit rates. In the case that more financial and export credit dependant industries had higher exit rates during the crisis, the parameters λ_2 and λ_3 should be both positive. By contrast, for entry rates both parameters should be negative.

4. ECONOMETRIC RESULTS FOR THE INTENSIVE MARGIN

In all of our regressions, as we noted in the specifications for export growth and entry and exit rates, we include industry-time specific effects that control for common time varying shocks across industries, and country-time specific effects that control for time varying shocks that are destination country specific. This would allow controlling, in part, for demand-driven causes of international trade contraction. In fact, if credit dependent industries are more affected during the financial crisis, this would be captured by the industry-time specific effects. In the case that the severity of the crisis differs across countries and then impacted differently the demand for Chilean exports, this is captured by country-time specific effects. In the case of the intensive margin with firm-level data, we estimate using weighted regressions using exporter size as weights.

Our basic results for export growth are presented in Table 3. In general, the evidence shows a negative relationship between exporter size and export growth, suggesting that smaller exporters tend to grow more than larger exporters.[12] The negative parameter for the interaction between size and crisis (columns 1 and 2) reveals that larger exporters were more negatively affected than smaller exporters. This is consistent with the stylized facts presented in Section 2, showing that the percentage of exporters with negative growth increased more rapidly for exporters in the first two quartiles of the

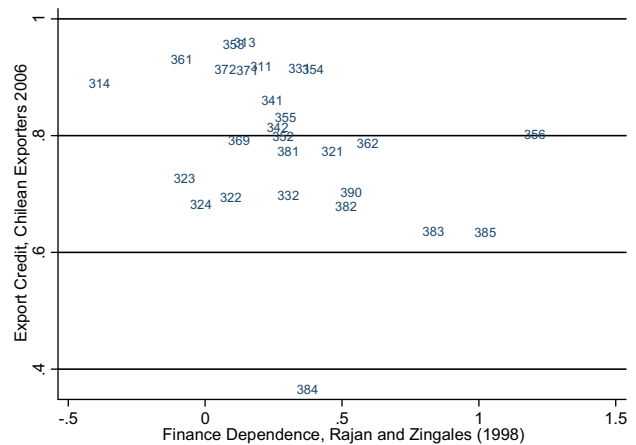Figure 8. *Comparison of export credit across Industries.*

Figure 9. *Export credit and financing dependence. Source: Rajan and Zingales (1998), own calculations.*

exports size distribution. Our results for Chile, even when using a continuous variable for size, are similar to those found by Bricongne *et al.* (2012) for France.[13] In both economies, it is found that large exporters were disproportionately more affected by the crisis.

In column (3) of Table 3 we add the interactions between size, crisis, and the measures of credit dependence.[14] The triple interaction for export credit is negative but not significant, suggesting that there are not differences in the effect of the crisis by size, for firms located in industries differing in export credit needs. In contrast, the parameter for the triple interaction of size, crisis, and financing dependence is negative, suggesting that the negative effect of the crisis is higher for larger firms, in more financing dependent industries.

To better appreciate these differences across industries and by firm size, we show in Table 4 the effect of crisis for different values of firm size and the two measures of credit dependence. For each case, the rest of the variables are evaluated at the corresponding mean. First, we find that financial crisis reduced the export growth rate in 10% for the average exporter. This effect, however, is almost zero for smaller firms (size evaluated at the bottom 10% of the distribution). By contrast, the reduction is about 29% for larger exporters (size evaluated at the top 10% of the distribution).

Second, we calculate the crisis effect in different exporter sizes for different values of overall and export financing. This exercise allows us to evaluate which of our two variables is relatively more important in explaining the negative effect of the international crisis on export growth. In both cases, we change the financing indicators by one standard deviation and compute the crisis effect. For the three sizes analyzed (mean, 10% larger and 10% smaller), we do not find significant differences in the crisis effect evaluated at the mean of the explanatory variables, and the crisis effect increasing financial dependence by one standard deviation. The negative effect for the average exporter only increases from 9.0% to 11.0%. However, the magnitude of the negative effect of the crisis changes significantly when export credit increases in one standard deviation. For the average exporter in an average export credit dependant industry, the reduction in export growth increases from 10.0% to 16.0%. For larger exporters (top 10% of size), the negative effect increases from 29% to 48.7%.

In sum, our results so far for export growth show that the financial crisis had more negative effects on large firms exporting in those industries where overall financing needs tend to be

Table 3. *Main results*

Variables	(1)	(2)	(3)
Size	−2.908***	−36.34***	−41.41***
	(0.655)	(8.796)	(10.66)
Size * Crisis	−1.130***	−0.998***	2.971
	(0.396)	(0.360)	(7.229)
Size * ECredit		37.62***	43.56***
		(9.941)	(11.88)
Size * Crisis * ECredit			−4.579
			(7.741)
Size * FinDep.			2.118
			(2.076)
Size * Crisis * FinDep.			−4.393**
			(1.724)
Constant	−1.586***	−1.614***	−1.619***
	(0.0257)	(0.0262)	(0.0267)
Observations	354925	354925	336748
R-squared	0.011	0.015	0.017

Clustered standard errors at country-industry-year level between parentheses.
*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.

more important. The role of export credit tends to be less important.

We introduce several additional estimations for verifying the robustness of our results. It can be argued that the importance of export credit may be different across market destinations. This could be the case when exports in the same industry may be subject to a different likelihood of no payment, depending on regulatory or institutional characteristics of the importer country. Moreover, exporters can specialize in selling different products to different countries, even within the same industry. To deal with this problem, we compute our variable of export credit dependence for two groups of countries: industrial and developing countries. [15] There are two reasons for this choice. First, there are not enough observations for computing industry-specific measures for each importer country. Second, the correlation between institutional quality and income is relatively high. Thus, splitting our measure in two income groups should be sufficient to check whether these differences exist and affect our previous results. As shown in Figure 10, the correlation of export credit for these two groups is high, as it would be expected whether technology (or other exogenous reasons) is the main explanation of why some industries rely more on export credit than others. [16]

It can also be argued that the importance of trade credit may vary not only across industries but also across firms in the same industry. To deal with this problem, we introduce industry-specific measures of export credit for large and small firms. [17] The differences between these two groups of firms

can be supply and demand driven. In fact, smaller exporters may have less internal resources for financing exports and may be less able to sell at credit. Moreover, importers can be less confident on products' quality of small exporters and, therefore less willing to pay in cash for these exports. Then, for all of the industries, we calculate the importance of export sold at credit in total exports for small and large exporters and we use this measure in our estimations. The correlation between these two measures is shown in Figure 10.

The results are shown in Table 5 for both measures: industry specific export credit for industrial and less developing countries (column 1) and industry specific export credit for large and small exporters (column 2). Results tend to be very similar to those previously found, revealing that the negative effect of the crisis tends to be higher for larger exporters in financing dependent industries and that dependence on export credit tends to be less relevant for explaining the export contraction during the crisis. This is confirmed in the calculations of the crisis effects shown in Tables 6 and 7. As it can be appreciated, the findings are very similar to those reported in Table 4 calculated for our basic regression.

We use also export quantity growth instead of export value growth as our dependent variable for isolating the negative effects of the international crisis on export prices. [18] The results are shown in column 3 of Table 5. In general, our main results hold. Naturally, given that financial crisis depressed prices, its negative effect on export quantity growth is lower compared to export value growth. We find a contraction of 5.5% for average exporter and 18% for larger exporters. As before, the impact on smaller exporters is lower than the effect on larger exporters (Table 8) (see Fig. 11).

Given that industry classifications can hide firm–specific heterogeneity in export credit dependence that is not rightly captured by the splitting of the sample between small and larger exporters, we also use firm-specific information on the importance of export credit. We calculate the average exports sold at credit for each firm in the period before the crisis (2000–2006). Our results suggest, again, that large exporters are more affected by the crisis and that firms more dependent on export credit are relatively more affected than those with lower dependence on this financing. The average effect of the crisis is a contraction of about 10% for a firm using the sample average of export credit, but 12% for a firm using higher export credit in one standard deviation.

We have also analyzed how robust are our results to potential endogeneity of exporter size. It can be argued that firm-specific shocks can affect both size and export growth. [19] In absence of good instruments for size, we deal with this problem using alternative definitions of exporter size. We define a two-year lagged definition of relative size, which it can be assumed to be predetermined whether firm-specific shocks are not very persistent. The crisis effect corresponding to this estimation is shown in Table 9 and they suggest that our previous results, in general, hold. The most affected firms in

Table 4. *Crisis effects*

	Average explanatory variables	Financing dependence + 1 st. dev.	Export credit dependence + 1 st. dev.
Average size	−0.1001*** (−0.152;−0.047)	−0.168*** (−0.257; −0.079)	−0.115*** (−0.181; −0.051)
10% Size	−0.0009*** (− 0.001; −0.0004)	−0.0016*** (−0.002;−0.0007)	−0.0011*** (−0.0017;−0.0004)
90% Size	−0.2901*** (−0.441;−0.1387)	−0.487*** (− 0.745; −0.228)	−0.335*** (− 0.523; − 0.146)

Confidence interval between parentheses.
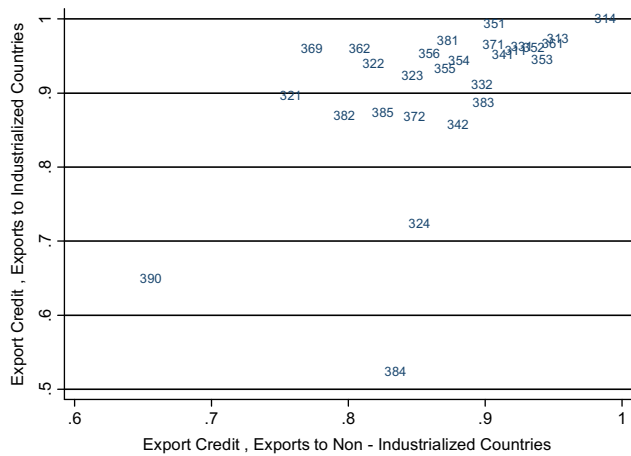*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.

Figure 10. *Export credit by groups of countries. Source: Own calculations.*

Table 5. *Robustness analysis*

Variables	(1)	(2)	(3)
Size	−29.29***	−45.75***	−35.32***
	(9.476)	(11.02)	(12.51)
Size * Crisis	−0.124	2.008	9.803
	(6.388)	(7.455)	(8.268)
Size * ECredit.	29.99***	48.08***	34.81**
	(10.56)	(12.19)	(13.96)
Size * Crisis * ECredit	−1.232	−3.552	−11.64
	(6.815)	(7.958)	(8.975)
Size * FinDep.	0.555	2.897	−1.351
	(2.107)	(2.085)	(2.798)
Size * Crisis * FinDep.	−3.669**	−4.296**	−4.670**
	(1.651)	(1.728)	(2.010)
Constant	−1.612***	−1.617***	−1.750***
	(0.0275)	(0.0263)	(0.0235)
Observations	336748	336748	701246
R-squared	0.016	0.018	0.019

Clustered standard errors at country-industry-year level between parentheses.

 * $p < 0.1$.
 ** $p < 0.05$.
 *** $p < 0.01$.

terms of export growth are large exporters in more financial dependent industries.[20]

We have also estimated several additional regressions using a simpler specification for looking at how financial crisis affected export growth excluding the interaction with exporter size and defining export growth over all countries where the firm exports. We have also examined whether our results for export credit differ depending on distance to the importer. In general, we find similar results to our basic findings. The only difference when we estimate the model for less and more distant countries, using the median of distance from Chile for splitting the sample, is that the negative effect of the crisis is larger for more distant export destinations. For less and more distant countries, export contracted 9.3% and 12.2%, respectively, in the average exporter. Also, for industries with export credit dependence of one standard deviation about the mean, the average exporter reduced export by 11.4% in less distant countries and 15.7% in more distant destinations.

In sum, using several robustness checks, our main message that more affected firms in the intensive margin are larger exporters in more financing dependent industries does not change with alternative definitions of export credit, other measures of exporter size and looking at differential effects depending on distance to export destinations.[21] In the next section, we show our results for the extensive margin on exports.

5. ECONOMETRIC RESULTS FOR THE EXTENSIVE MARGIN

In the previous section, we show the results for the effect of the financial crisis on the intensive margin of exports. In this section, we concentrate on how entry and exit of exporters (extensive margin) were affected by the financial crisis. We also look at how this effect depends on the financial and export credit dependence of industries.

Following the findings reported in the previous section, we expect that financial crisis reduced entry rates and increased exit rates. Considering the effects across firm size, under the hypothesis that small exporters are more affected by financial constraints, we expect a larger negative effect of the crisis on entry rates for smaller exporters and a larger increase in exit rates for these firms.

Finally, if financial and credit dependence were important for the extensive margin of exports, we expect a negative parameter for the interaction between crisis and the measures of credit dependence in the case of entry rates, and a positive one for entry rates. That is, the financial crisis should have a more negative effect of entry rates for more financial and export credit dependent industries. In the same vein, the crisis should have increased the exit rates more disproportionately in financial and export credit dependent industries.

The results for entry and exit rates by exporter size are shown in Table 10. Columns (1)–(4) correspond to estimations for the smaller to larger exporters according to the quartiles of the export size distribution. As can be appreciated in this Table, the financial crisis increased the exit rates and we find that this effect is larger and significant during 2009. Comparing the effect across specifications, the results suggest that this negative effect on entry rates was larger for smaller exporters.

Given that crisis years are also included as interaction with industry characteristics, we calculate the crisis effect during the year 2009 using the average value of the two industry-specific financial variables to better appreciate the effect of the financial crisis across firm size. These results are presented in Table 11. As it can be appreciated, there is negative relationship between the effect of the crisis and the size of exporters. We find that the financial crisis increased the exit rate in about 24% for smaller exporters (Quartile 1), and approximately 2% in larger exporters (Quartile 2).

The interaction terms between crisis and financial variables are mostly negative, which is contrary to what we expected given that the increases in exit rates are found to be lower for more financial and export credit dependent industries. However, some of these differences in the impact of financial crisis across industries are not very important from an economic point of view. For small exporters, an increase in one standard deviation of our measure of overall financial dependence indicates a reduction of 20.4% in the entry rate of smaller exporters during 2009 (Quartile 1), slightly higher than the negative effect of 24.2% for the average industry. In the case of export credit, the differences are more relevant. An increase in one standard deviation of this indicator reduces the negative effect of the crisis to 13.8% for smaller exporters (Table 11)

Table 6. *Crisis effects export credit for industrial and developing countries*

	Average explanatory variables	Financing dependence + 1st. dev.	Export credit dependence + 1st. dev.
Average size	−0.098***	−0.155***	−0.103***
	(−0.15; −0.044)	(−0.244; −0.065)	(−0.167; −0.039)
10% Size	−0.0009***	−0.0014***	−0.0009***
	(−0.0014; −0.0004)	(−0.002; −0.0006)	(−0.0017; −0.0004)
90% Size	−0.285***	−0.449***	−0.298***
	(−0.44; −0.129)	(−0.708; −0.19)	(−0.484; −0.113)

Confidence interval between parentheses.
*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.

Table 7. *Crisis effects export credit for small and large exporters*

	Average explanatory variables	Financing dependence + 1 st. dev.	Export credit dependence + 1st. dev.
Average size	−0.101***	−0.167***	−0.114***
	(−0.154; −0.048)	(−0.255; −0.081)	(−0.179; −0.048)
10% Size	−0.0009***	−0.0016***	−0.0011***
	(−0.0014; −0.0004)	(−0.002; −0.0007)	(−0.0017; −0.0004)
90% Size	−0.293***	−0.486***	−0.331***
	(−0.447; −0.141)	(−0.739; −0.233)	(−0.521; −0.141)

Confidence interval between parentheses.
*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.

Table 8. *Crisis effects export quantity growth*

	Average explanatory variables	Financing dependence + 1 st. dev.	Export credit dependence + 1st. dev.
Average size	−0.055***	−0.107***	−0.082***
	(−0.097; −0.013)	(−0.181; −0.034)	(−0.141; −0.023)
10% Size	−0.0004***	−0.0008***	−0.0006***
	(−0.0007; −0.0001)	(−0.0014; −0.0002)	(−0.0011; −0.0001)
90% Size	−0.179***	−0.351***	−0.267***
	(−0.316; −0.043)	(−0.591; −0.111)	(−0.458; −0.075)

Confidence interval between parentheses.
*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
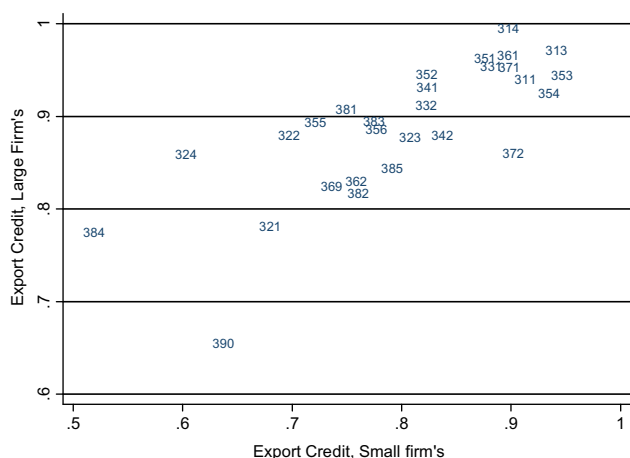
Figure 11. *Export credit by exporter size. Source: Own calculations.*

The results in Table 10 for entry rates show that, in general, the financial crisis had a negative impact on new exporters. Similarly to what we find for exit rates, the effect is larger and generally significant during 2009. These larger effects for entry and exit rates during 2009 are consistent with the evidence that export contraction was more evident at the end of 2008, after Lehmańs bankruptcy.

We show in Table 12 the crisis effect calculated at the average value of the industry-specific financial variables. Consistent with the evidence shown above, these results suggest that the financial crisis has a large effect on smaller exporters. In fact, entry rates were reduced by 22.8% for exporters in the first quartile of the size distribution and only by 1.8% for those in the fourth quartile.

It can be also noted that interaction terms between crisis and financial variables are mostly positive, suggesting that, unexpectedly, more financial and export credit dependent industries were not more negatively affected during the crisis in terms on entry. Again, the differences across industries are

Table 9. *Crisis effects exporter size lagged two years*

	Average explanatory variables	Financing dependence + 1 st. dev.	Export credit dependence + 1 st. dev.
Average size	-0.051^{**} (−0.098; −0.0051)	-0.119^{***} (−0.201; −0.038)	-0.127^{***} (−0.2; −0.054)
10% Size	-0.0011^{**} (−0.0019;−0.0001)	-0.0023^{***} (−0.004;−0.0007)	-0.0025^{***} (−0.004;−0.001)
	-0.322^{***} (−0.45;−0.18)	-0.443^{***} (− 0.692; −0.194)	-0.366^{***} (− 0.539; − 0.193)
90% Size	-0.153^{**} (−0.292;−0.015)	-0.355^{***} (−0.596;−0.11)	-0.376^{***} (−0.592;−0.161)

Confidence interval between parentheses.
$^{*}p < 0.1.$
$^{**}p < 0.05.$
$^{***}p < 0.01.$

Table 10. *Entry and exit rates*

Variables	Exit rates				Entry rates			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Crisis 2008	0.628^{***}	0.206	0.0478	−0.0522	-0.946^{***}	-0.408^{***}	−0.0229	−0.0855
	(0.146)	(0.138)	(0.128)	(0.105)	(0.162)	(0.154)	(0.142)	(0.0987)
Crisis 2009	1.421^{***}	0.431^{***}	0.172	0.196^{*}	-1.837^{***}	-0.665^{***}	-0.292^{**}	−0.150
	(0.147)	(0.139)	(0.128)	(0.106)	(0.163)	(0.155)	(0.143)	(0.0989)
Crisis 2008 ∗ *Fin.Dep*	−0.0287	−0.0354	-0.0560^{*}	-0.0646^{**}	0.0725	0.0399	−0.00865	−0.0150
	(0.0490)	(0.0409)	(0.0337)	(0.0254)	(0.0543)	(0.0456)	(0.0376)	(0.0237)
Crisis 2008 ∗ *ECredit*	-0.562^{***}	−0.204	−0.0484	0.0510	0.895^{***}	0.382^{**}	−0.00209	0.0887
	(0.158)	(0.148)	(0.137)	(0.117)	(0.175)	(0.165)	(0.153)	(0.109)
Crisis 2009 ∗ *Fin.Dep*	-0.131^{***}	0.0126	−0.0323	−0.0143	0.124^{**}	−0.0230	−0.0414	0.00479
	(0.0494)	(0.0409)	(0.0339)	(0.0254)	(0.0548)	(0.0456)	(0.0377)	(0.0238)
Crisis 2009 ∗ *ECredit*	-1.289^{***}	-0.404^{***}	−0.134	-0.197^{*}	1.778^{***}	0.627^{***}	0.245	0.148
	(0.159)	(0.149)	(0.138)	(0.117)	(0.177)	(0.166)	(0.153)	(0.109)
Constant	0.503^{***}	0.471^{***}	0.342^{***}	0.237^{***}	0.975^{***}	0.637^{***}	0.392^{***}	0.183^{***}
	(0.00879)	(0.00738)	(0.00653)	(0.00550)	(0.00973)	(0.00822)	(0.00728)	(0.00514)
Observations	3597	3521	3414	3260	3597	3521	3414	3260
R-squared	0.193	0.034	0.022	0.023	0.173	0.056	0.039	0.005

Robust standard errors at between parentheses.
$^{*}p < 0.1.$
$^{**}p < 0.05.$
$^{***}p < 0.01.$

Table 11. *Crisis effects on exit rate*

	Average explanatory variables	Financing dependence + 1st. dev.	Export credit dependence + 1st. dev.
Q1	0.242^{***} (0.217; 0.266)	0.204^{***} (0.167; 0.242)	0.138^{***} (0.101; 0.174)
Q2	0.0757^{***} (0.055; 0.096)	0.079^{***} (0.049; 0.109)	0.0438^{**} (0.013; 0.073)
Q3	0.0443^{***} (0.025; 0.0627)	0.0344^{**} (0.008; 0.061)	0.0341^{**} (0.008; 0.6007)
Q4	0.017^{**} (0.001; 0.032)	0.0125 (−0.011; 0.0363)	0.0025 (−0.021; 0.026)

Confidence interval between parentheses.
$^{*}p < 0.1.$
$^{**}p < 0.05.$
$^{***}p < 0.01.$

more relevant for overall financial dependence. For smaller exporters, the effect of the crisis was a reduction of 19.3% in entry rates for industries with financial dependence one standard deviation above the average. In the case of export credit, industries with one standard deviation above the average experienced a negative effect on entry rates of 8.5%. In the case of larger exporters, the effects of the crisis during 2009 are not significant for those industries with higher financial and export credit dependence.

We have checked the robustness of these results to alternative definitions of our dependent variable. Instead of using entry and exit rates, we take the number of exporters, entrant and quitters (in logs) by size, country, and industry and we run a similar estimation controlling for time varying industry and country specific shocks. The results tend to confirm these findings. We find that the crisis reduced the total number of exporters, especially in 2009, and that this effect is larger for smaller exporters. In terms of the number of exporters exiting from international markets, the crisis was associated with an increase in the number of quitters and the effect is more pronounced for exporters in the first quartile of the size distribution. Similarly, the crisis reduced the number of entrants, but more importantly for the first three quartiles of the size distribution.

6. CONCLUSIONS

The purpose of this paper was to analyze the role of financial factors in explaining the great trade collapse in the aftermath of the 2008–09 global financial crisis. This is a contribution

Table 12. *Crisis effects on entry rate*

	Average explanatory variables	Financing dependence + 1st. dev.	Export credit dependence + 1 st. dev.
Q1	−0.228[***] (−0.255; −0.2013)	−0.193[***] (−0.234; −0.152)	−0.085[***] (−0.125; −0.0447)
Q2	−0.115[***] (−0.138; −0.0922)	−0.121[***] (−0.155; −0.088)	−0.065[***] (−0.099; −0.032)
Q3	−0.086[***] (−0.106; −0.065)	−0.098[***] (−0.128; −0.069)	−0.067[***] (−0.096; −0.0387)
Q4	−0.018[**] (−0.032; −0.0035)	−0.0164 (−0.038; 0.005)	−0.006 (−0.029; 0.015)

Confidence interval between parentheses.
[*] $p < 0.1$.
[**] $p < 0.05$.
[***] $p < 0.01$.

to the empirical literature investigating the causes of great trade collapse using two measures of financial dependence.

Using monthly data covering all Chilean exporting firms during the period 2006–09, we analyze the effect of the financial crisis on two different margins of export: export growth (intensive margin) and entry and exit (the extensive margin). The stylized facts suggest that export contraction was generalized across firms, industries, and destination markets, but penalized larger firms more in terms of export growth.

Our econometric results show that both overall financing and export credit were significant determinants of export contraction, but especially for the intensive margin. The evidence shows that larger exporters belonging to industries more dependent on overall credit have experienced a large contraction of exports. In contrast with results for export growth that suggest that large exporters were more affected by the financial crisis, we find that smaller exporters experienced lower entry and higher exit during the crisis. These results indicate that export contraction was heterogeneous across exporter size, industry credit and financial dependence, and export margins.

Our main findings hold to several robustness checks for our variable measuring export credit dependence and alternative specifications of export growth and the extensive margin. This evidence has relevant policy implications as public policy aiming at stimulating trade credit may not be as effective if overarching credit conditions remain subdued.

NOTES

1. Baldwin (2009) labels this episode "The great trade collapse" given its reach, abruptness, severity, synchronicity, and the fact that it was the steepest fall of world trade in recorded history and the deepest fall since the Great Depression.

2. To be clear, the use of external financing in the terminology of Rajan and Zingales (1998) makes reference to the financing that is external to firm. This is, investment which is not financed with own resources.

3. This identification strategy has been used previously in the empirical literature of finance and international trade. See, for example, Beck and Levine (2002) and Manova (2008).

4. Copper is the most important exported product by Chile, but the variation in export value has been heavily driven by large variations in its international price. For this reason, we concentrate in the non-copper Chilean exports.

5. In this paper we refer to industries or sectors using the 3-digit ISIC classification.

6. The main advantage of this method over more traditional ones is that it makes it possible to compute growth rates for newly created or destroyed flows, in this case for firms that exit or enter international markets.

7. The starting date of the crisis dummy coincides with the bankruptcy files of Lehman Brothers, given that this fact has been widely considered as the beginning of the financial crisis. The final date of the dummy corresponds with the last available information at the moment of initiating this paper.

8. The base category in these estimations is 2007. Then, the parameters for the crisis dummy variables compare entry and exit rates in 2008 and 2009 relative to 2007.

9. According to the US Department of Commerce (2008), exporters who use this payment mechanism may lose to other competitors who offer more attractive payment terms, and therefore, is a less used alternative.

10. This insurance provides between 85% and 95% coverage against commercial and political risks that results in importer payment defaults.

11. The correlation coefficient between both variables is −0.44 and statistically significant at 5%.

12. In these regressions and the rest ones presented in the paper, the R^2 are very low. Given that firm-level data can be very noisy, we have excluded the top and the bottom 5% of the distribution of the dependent and independent variables and the R^2 increased from 1% to 2%.

13. They use dummy variables for relative exporter size using four quartiles of this distribution.

14. Note that we do not add the interaction term between credit dependence and crisis, because this effect is already captured in the industry-year fixed effects.

15. Industrial countries are defined as those high-income countries members of the OECD.

16. The correlation coefficient is 0.53 and statistically significant at 5%.

17. To divide the sample between large and small exporters we use the median size within each industry.

18. This can be done because the information from Chilean Customs identifies the quantity sold by exporters. Note that quantities are not strictly comparable between products, because they are measured in different units. For this reason, we compute export growth and exporter size relative to the same 8-digit category of the Harmonized System. This is the reason why in the next regressions the number of observations increases considerably. However, we have checked that our previous results do not change if we define export growth and relative size by 8-digit products. These results are available upon request.

19. We thank anonymous referees for pointing us the robustness checks that we summarize below.

20. Similar to Bricongne *et al.* (2012) we have used dummy variable by size quartiles instead of continuous relative size. The argument is that it would be less likely that firm specific shocks affect the relative position of exporters in the distribution of size. In other words, it is more difficult that these shocks move exporters from one quartile to another. The results, available upon request, confirm also our previous findings.

21. To save space we do not include these regressions, but they are available upon request.

REFERENCES

Amiti, M., & Weinstein, D. (2011). Exports and financial shocks. *Quarterly Journal of Economics, 126*(4), 1841–1877.

Baldwin, R. (2009). The great trade collapse: What caused it and What does it mean? In *The great trade collapse: Causes, consequences and prospects*. Online book available at <http://www.voxeu.org/reports/great_trade_collapse.pdf>.

Beck, T., & Levine, R. (2002). Industry growth and capital allocation: Does having a market-or bank-based system matter?. *Journal of Financial Economics, 64*(2), 147–180.

Baldwin, R., & Evenett, S. (2009). Introduction and recommendations for the G20. In Richard Baldwin, & Simon Evenett (Eds.), *The collapse of global trade, murky protectionism, and the crisis: Recommendations for the G20* (pp. 1–9). London: CEPR (Chapter 1).

Bernard, A. B., Jensen, J. B., Redding, S. J., & Schott, P. K. (2009). *The margins of US trade (long version)*. NBER working paper nr. 14662, National Bureau of Economic Research.

Bricongne, J., Fontagne, 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.

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.

Eaton, J., Kortum, S., Neiman, B., & Romalis, J. (2010). *Trade and the global recession*. NBER working paper no. 16666.

Greenaway, D., Guaruglia, A., & Kneller, R. (2007). Financial factors and exporting decisions. *Journal of International Economics, 73*(2), 377–395.

Levchenko, A., Lewis, L., & Tesar, L. (2010). *The collapse of international trade during the 2008–2009 crisis: In search of the smoking gun*. NBER working paper 16006.

Manova, K. (2008). Credit constraints, equity market liberalizations and international trade. *Journal of International Economics, 76*(1), 33–47.

Rajan, R., & Zingales, L. (1998). Financial dependence and growth. *American Economic Review, 88*(3), 559–586.

Rappoport, V., Paravisini, D., Wolfenzon, D., & Schnabl, P. (2011). *Dissecting the effect of credit supply on trade: Evidence from matched credit-export data*. NBER working paper no. 16975.

US Department of Commerce (2008). *Trade finance guide: A quick reference for US exporters, April*.

World Bank (2010). *Prospects for the global economy: Global economic prospects 2010: Crisis, finance and growth*.