

Did export promotion help firms weather the crisis?

Johannes Van Biesebroeck, Jozef Konings and Christian Volpe Martincus

KU Leuven and CEPR; KU Leuven and CEPR; Inter-American Development Bank

1. INTRODUCTION

The precipitous decline of international trade relative to GDP in the 2008-2009 recession has received quite some attention in the recent academic literature. Shocks to both demand and trade costs have been suggested as important channels (Eaton et al., 2011). Among the most prominent explanations for the great trade collapse are worsening credit conditions (Chor and Manova, 2012), input demand linkages between sectors coupled with trading frictions (Bems, Johnson and Yi, 2011; Bussière et al., 2011) or reduced expenditure on manufactured goods in general (Behrens, Corcos and Mion, 2013). The literature has provided some insights to understand the mechanisms behind the trade decline and to explain its magnitude, but has devoted less attention to formulating appropriate policy responses. Initially, there was a fear that countries would raise protectionist barriers, although by and large this did not materialize (Bown and Crowley, 2012). There has been surprisingly little discussion on how governments could help firms cope with the fallout from foreign demand and the increase in trading frictions.

In this paper we investigate whether a targeted government program of export promotion support can help countries restore their pre-crisis export levels. A growing

Financial support from KU Leuven Program Financing is gratefully acknowledged. We would like to thank Carlos Salamanca Malagón and Victoria Valente for excellent research assistance, the National Bank of Belgium, FIT and PROMPERU for access to the Belgian and Peruvian data respectively, and Heather Booth di Giovanni, Julian di Giovanni, Jan Krahnen and Nicola Fuchs-Schündeln for helpful suggestions. The views and interpretations in this paper are strictly those of the authors and should not be attributed to the Inter-American Development Bank, its executive directors, its member countries, the National Bank of Belgium, PROMPERU, or FIT.

literature has documented the success of such programs in raising exports in general. It is conceivable that they are also a valuable tool to help the private sector recover from a large trade decline, as experienced by many firms in 2009. The vast majority of countries now run active export promotion programs to facilitate domestic firms' entry into the export market and support subsequent export sales (Lederman, Olarreaga and Payton, 2010; Volpe Martincus, 2010). Rather than provide direct subsidies, these programs work mainly as an information depository or a way to spread fixed information acquisition costs over exporters. They help firms to learn about foreign demand for their products, establish relationships with importers, identify promising new distribution channels, and overcome administrative or trade frictions such as customs procedures and foreign regulations or product standards.

We consider that export promotion only consists of 'information brokering and facilitation.' Many countries operate separate programs that provide direct export subsidies, trade credit and insurance, or state guarantees, which did play a role during the crisis in temporarily lifting liquidity constraints or cushion increases in the cost of credit. For example, Felbermayr, Heiland and Yalcin (2012) study a program of state credit guarantees in Germany that helped sustain export levels. Effects were stronger when market risk was high and when refinancing conditions were tight, as during the financial crisis. More generally, exports are sensitive to financial shocks since international trade tends to involve higher default risk and liquidity problems. Thus, Amiti and Weinstein (2011) showed that an important determinant of firm-level exports during a crisis is the health of exporters' financial institutions.

The latter types of interventions tend to distort competition and in that way impose a burden on other countries. Especially in the context of the great recession, subsidy programs or direct financial support will have stronger 'beggar-thy-neighbor' effects and are more likely to raise concerns by trading partners whose firms also faced a collapse in global demand. The export promotion programs we study are less likely to impose costs on other countries as they merely aim to reduce transaction costs by reducing information asymmetries and alleviate uncertainty (Copeland, 2008). Aggregate market uncertainty has been particularly relevant during the great recession compared to milder downturns. Since export promotion does not change variable costs relative to trading partners, it is less likely to distort international competition. Moreover, as all exporters have access to these services, domestic competition is not distorted either.

Theoretical models of international trade provide some insights into the channels through which export promotion can help dampen business cycle effects. In the canonical heterogeneous firm model (see Melitz and Redding, 2014), only those firms with a productivity level that exceeds a certain threshold can profitably enter the export market. These destination-specific productivity thresholds are increasing functions of bilateral variable costs and fixed costs of trade, which export promotion can help lower. For example, international trade involves higher transaction times due to additional paperwork, preparation of goods for international shipping, customs procedures, or simply longer transit times (Djankov, Freund and Pham, 2010; Volpe Martincus,

Carballo, and Graziano, 2015). Increased uncertainty about global demand and tighter financial constraints during the crisis are likely to raise these costs.

Moreover, lower domestic demand will force firms to operate at lower capacity utilization and sacrifice some scale economies. With lower effective productivity, it is even harder to reach the productivity threshold to operate profitably in foreign markets and some firms will exit, at least temporarily. If some of the fixed costs of exporting are sunk (Roberts and Tybout, 1997), liquidity constraints can induce wasteful export market churn. To the extent that export promotion helps firms avoid some fixed costs, at least temporarily, they are more likely to survive on the export market. A recent study by Eaton et al. (2014) provides evidence that surviving in a foreign market requires continuous search effort for new clients. As existing partners go bankrupt during a crisis, information provision by export promotion agencies becomes more valuable.

We make three contributions to the export promotion literature. First, ours is the first paper to analyze the impact of export promotion during the great trade collapse. In line with previous studies, we exploit detailed information on export transactions observed by firm, product and destination market. A second contribution is to evaluate similar export promotion policies for two economies, Belgium and Peru, with a different type of integration in international markets and different comparative advantages. We investigate whether this influences the effectiveness of export promotion activities. Belgian firms are strongly integrated into the EU economy—about 50% of exports go to its immediate neighbors—and they mostly export differentiated manufacturing goods. Peruvian firms export primarily to faraway places—fewer than 20% of exports remain in Latin America or the Caribbean—and the national export portfolio is dominated by mining products, basic manufacturers, and agricultural or food products. Third, we do not only study the impact of export promotion on firms' level of exports, but look specifically at whether it helps firms to survive in the export market overall or in destination or product markets that are especially hard hit by the financial crisis.

A first descriptive analysis illustrates that the export decline during the recession was very sudden in both countries, limited to 2009 and 2010, and mostly due to reduced firm-level sales on existing export markets. Therefore, we use firm-level total export as our primary dependent variable. Further preliminary evidence suggests that self-selection into export support cannot be ruled out and has to be taken into account to identify causal effects on performance. In the absence of a plausible instrument, we follow the literature and at first address program endogeneity by relying on the selection-on-observables assumption, i.e. that potential exports for supported and other firms are the same in expectation after conditioning on a rich set of control variables. We later estimate our model at the firm-market level as well, which allows the inclusion of firm (and market) fixed effects to control more flexibly for a firm-level unobservable in export performance. We show OLS results and implement two alternative estimators from the treatment evaluation literature, i.e. a matching estimator and inverse-probability weighting, that achieve the conditioning on observables more flexibly.

The results indicate that supported firms have higher exports during the crisis and that the magnitude of the difference is rather similar for the two countries. Supported firms

are significantly more likely to remain active exporters—especially Peruvian firms and Belgian firms that export outside the EU—and they export relatively more than unsupported firms. We still find positive effects if we identify them from exporters' relative performance in product and destination markets most affected by the crisis, while controlling for unobservables using firm-fixed effects. In most specifications we find that the destination and product extensive margins are the primary channels for superior firm-level export performance. Supported firms export more because they are significantly more likely to continue exporting to destinations directly hit by a financial crisis and to continue exporting products that are most crisis-prone, such as capital goods or in industries sensitive to financial constraints. Export volumes for supported firms are often not significantly different from those of control firms that manage to survive in the same destinations or product markets. An exception are the results for Peru, which are large and borderline significant in the firm-destination regressions and strongly significant in the firm-product-destination regressions for 2009 and 2010.

The remainder of the paper is organized as follows. We start in Section 2 with a review of the existing evidence on the export-boosting success of trade promotion programs, both from a macro and a micro perspective. In Section 3 we provide some background information on the activities of the two agencies we study. In Sections 4 and 5 we discuss the data and document the evolution of exports and the use of export support services during the crisis. The empirical framework for assessing whether the quick recovery of exports is systematically related to export promotion is presented in Section 6, followed by our estimates in Section 7. Finally, in Section 8 we provide some policy conclusions.

2. WHAT DO WE KNOW ABOUT THE EFFECTS OF EXPORT PROMOTION?

2.1. Defining export promotion

Governments around the world use various policy instruments to stimulate their firms' exports.¹ Leaving aside macroeconomic measures such as exchange rate policy, some of these instruments provide firms with financial resources directly or help them indirectly cope with a credit crunch. These include direct subsidies associated with export requirements (Helmers and Trofimenko, 2013; Defever and Riaño, 2014) and export credit guarantees (Abraham and Dewit, 2000; Egger and Url, 2006; Moser et al., 2008; Felbermayr and Yalcin, 2013). Some other policies that subsidize firms directly do not target exports, but are likely to affect them. These include, for example, production subsidies (Girma, Gong, Görg and Yu 2009, Girma, Görg and Wagner 2009), support for investing in technology, training, or physical capital (Görg et al., 2008), VAT reimbursement rules (Gourdon et al., 2014), and preferential regulation and taxation in economic development zones (Schminke and Van Biesebroeck, 2013).

¹ Private sector associations may also assist firms in selling abroad (Hiller, 2012).

In addition, there are “soft” public interventions aimed to stimulate exports. Two important policies are, first, general economic diplomacy, where governments rely on international relations through permanent foreign missions such as embassies and consulates or state visits (Rose, 2007; Nitsch, 2007; Head and Ries, 2010; Veenstra et al., 2010; Creusen and Lejour, 2012; Fergusson and Forslid, 2014), and, second, explicit export promotion programs (Lederman et al., 2010; Volpe Martincus, 2010).²

In this paper, we focus on the last instrument: support by export promotion agencies. It can be defined as a set of activities to help firms overcome internationalization obstacles, for example by providing data on the general export process and on specific markets and overseas business contacts, by disseminating information on domestic firms’ products and services, by assisting in the preparation and follow-up of firms’ participation in international marketing events such as fairs and missions, or by co-financing travel costs through matching grants.

These activities are likely to reduce the fixed costs that firms incur when penetrating a new foreign market and when searching for new customers in existing export markets. They address a market failure in the form of information externalities. As economic transactions resulting from successful searches reveal valuable information for third firms, they generate positive spillovers. If only part of the potential benefits accrue to the firms investing in searches, aggregate investment to explore business opportunities will be sub-optimally low, as will be the diversification of exports (Volpe Martincus, 2010).

It is worth mentioning that some support activities are carried out by foreign offices of export promotion agencies that may be located within embassies and consulates, or are even carried out by the diplomatic representations themselves. This introduces an identification challenge. Note, however, that export promotion organizations are typically highly specialized, often managed according to private sector practices and employing personnel with a background in international trade. This differs from embassies or consulates which do not always have a trade section and sometimes lack staff with the necessary business expertise or the time and incentives to assist exporters (Volpe Martincus, 2010).³

The effectiveness of export promotion has been evaluated in several ways. Researchers have relied on measures of export promotion at the agency level, in the form of available financial resources or the extent of the network of offices abroad, or at the beneficiary level, by observing which firms take advantage of these programs. Table 1 includes an exhaustive list of empirical evaluations that cover approximately the last two decades. We first review analyses with a macro perspective that relate export promotion organizations’ budget and network of offices to export volumes. Next we turn to studies that use a micro perspective to evaluate the impact of export promotion support on various dimensions of firm-level export performance.

² There are several papers that show the importance of access to financing for export (e.g., Amiti and Weinstein, 2011; Paravisini et al., 2015; and Niepmann and Schmidt-Eisenlohr, 2014).

³ Especially for developing countries, coordination between export promotion organizations and foreign diplomatic missions that are supposed to assist them in their work is generally weak (Volpe Martincus, 2010).

[Include Table 1 approximately here]

2.2. The macro perspective

2.2.1. Financial resources devoted to export promotion

A few studies examine the effects of trade promotion on trade outcomes by exploiting variation in public expenditures on these programs. At the regional level, Coughlin and Cartwright (1987) report that exports of US states covary positively with the states' trade promotion budget. In particular, each additional dollar in promotion expenditures is associated with \$432 additional manufacturing exports. In a similar study for Argentina, Castro and Saslavsky (2009) conclude that a dollar invested in export promotion translates into \$240 addition foreign sales for the average province. In contrast, making use of variation in the export support budget across US states normalized by the number of in-state firms, Bernard and Jensen (2004) find no systematic relationship with the export propensity of firms from each state, once a number of firm-level characteristics are controlled for. They conjecture that the lack of effect is the result of agencies targeting small and medium-sized firms, which rarely export anywhere.

At the national level, Lederman, Olarreaga, and Payton (2010) use a sample of export promotion organizations from 103 countries and show that their budgets are positively and statistically significantly related to national exports. They find an elasticity of 12%, which indicates that a one percent increase in an agency's budget is associated with 0.12 percent higher national exports. In absolute terms, evaluated for the median agency, a one-dollar increase in the trade promotion budget is associated with a 40-dollar increase in national exports.

While these numbers are useful as a first approximation for the relationship between resources spent on export promotion and export performance, the exact estimates should be read with extreme caution since the identification of such a relationship is subject to major data and methodological difficulties (Volpe Martincus, 2010).

2.2.2. Network of foreign offices

In the spirit of Rose (2007), several studies investigate the effects of either the presence or the number of foreign offices operated by export promotion agencies on both country and region-level export outcomes. Using bilateral product-level trade data from Spain for the years 1995-2011, Gil-Pareja et al. (2014) find that the export promotion offices established abroad by Spanish regions are associated with higher exports, particularly for differentiated goods. They highlight the expansion in the number of products and the number of transactions per product, but interestingly, they also find that the effect increases with the age of the office, a plausible proxy for its experience in a destination.

In the same vein, Hayakawa et al. (2014) find large effects from bureaus of Japan's and South Korea's trade promotion organizations. The presence of an office in a destination raises exports by a similar amount as would the establishment of a Free

Trade Agreement with that country, a remarkable finding. Finally, Cassey (2014) makes use of the location of overseas trade-support offices that individual US states have established. His sample contains 228 offices covering 31 countries. He estimates that an overseas branch lowers the variable export cost by between 0.04% and 0.10%, which makes them cost-effective if the annual export volume to a country exceeds \$850 million.

Given that the trade promotion agencies' budgets as well as the location of their offices are likely to be endogenous to the level of aggregate or bilateral exports, any causal interpretation is only as reliable as the identifying assumptions used in the estimations and specifically the instrumentation strategy (if any).

2.3. The micro perspective: Exploiting information on firm-level support

2.3.1. The impact on export outcomes

A large number of studies have directly evaluated the ability of national export promotion agencies to raise the exports of their clients. Researchers working with data from different countries have matched individual firm information on trade transactions to client registries from the aforementioned agencies, making impact evaluation studies possible at the firm level. Various statistical methods from the treatment evaluation literature have been used to construct an appropriate benchmark for treated firms. Following Volpe Martincus and Carballo (2008), many studies have used a matching difference-in-differences estimator, relying on propensity score matching to construct an appropriate control group. Other studies, for example, Van Biesebroeck, Yu and Chen (2015) and Volpe Martincus et al. (2012), used the propensity score to construct weights and implement a double-robust estimator.

Table 1 lists all studies using firm-level evidence on export promotion by country. In total, 21 studies covering 16 countries are listed, almost all conducted within the last decade. Studying the intensive margin of trade—i.e. the impact on a client's total export level—is easier than studying the firm extensive margin—i.e. whether support draws new firms into the export market—since the latter requires information on the universe of potential exporters. Most studies only observe outcomes for existing exporters, but it still allows researchers to evaluate effects at the product and the destination extensive margins. Helping firms diversify their exports and reach different destination or product markets is often an explicit goal of the agencies.

It is impossible to summarize all findings, but it is fair to say that almost all studies find a positive and significant effect of export promotion support on firm-level exports. Most studies rely on the selection-on-observables assumption, often supplemented with firm-fixed effects to control for time-invariant unobservable factors. The conclusion that export promotion causes higher exports is thus only valid if the unobservable factors that compel some firms to rely on export promotion, while other observationally equivalent firms do not rely on it, are uncorrelated with firms' export potential (in the absence of support). Unfortunately, this assumption is not testable. It is encouraging, however, that

the estimated effects tend to be larger when the type of firm or the type of trade is likely to face more severe information problems (Volpe Martincus, 2010).

First, trade promotion is estimated to have the strongest effects on export activities that involve the most information incompleteness. Effects are estimated to be particularly large at the firm extensive margin when firms attempt to venture into foreign markets for the first time (Cruz, 2014; Schminke and Van Biesebroeck, 2015; Lederman, Olarreaga and Zavala, 2015; Mion and Mušils, 2015), or when firms try to enter into an entirely new country or product market (Volpe Martincus and Carballo, 2008, 2010c; Schminke and Van Biesebroeck, 2015).⁴

Second, many studies document heterogeneous effects by firm and product types. For example, more complex goods are likely to face more severe information barriers, which is consistent with larger estimated gains for differentiated goods (Volpe Martincus and Carballo, 2012). Smaller firms with less exposure to international markets are likely to face greater difficulties obtaining the necessary trading information, which is in line with the higher estimated benefits of export assistance to these smaller firms (Munch and Schaur, 2015). Finally, bundled support services provided throughout the exporting process, e.g. accompany firms from the early business contacts to the establishment of commercial relationships, are found to be more effective than isolated actions, e.g. only providing matching grants to participate in an international mission (Volpe Martincus and Carballo, 2010a).

A recent study by Cadot et al. (2015) suggests that export promotion effects may not be durable. They show that both previously supported firms and control firms achieve the same export performance after a number of years. It should be noted, however, that this result is so far based on a single application, the Tunisian FAMEX initiative, which differs from the operations of traditional export promotion agencies in important aspects.⁵ Further research is needed to establish external validity.⁶ Our results below do show that export promotion helps firms survive on the export market, a necessary condition for long-term effects.

2.3.2. Beyond export outcomes and beyond export promotion

Mainly due to data limitations, several relevant policy questions are still unanswered. It is important to keep in mind that these programs aim to facilitate economic activities believed to generate productivity growth and employment expansion.⁷ By increasing foreign sales, trade promotion might improve firms' performance more broadly. Using firm-level data from Denmark, Munch and Schaur (2015) show that export promotion positively affects sales, employment, and worker productivity, particularly for smaller

⁴ UKTI, the UK trade and investment promotion organization, has a formal economic and research team that carries out and commissions evaluation studies, which can be found on their website.

⁵ Contrary to most programs, export promotion was outsourced to third parties selected by the participating firms themselves. It is not obvious that firms with no or little export experience would be able to select an appropriate service provider. Moreover, quality differences in these providers' services could translate into heterogeneity in the trade promotion treatment and reduce estimated persistence.

⁶ Carballo (2012) already provides some contrary evidence.

⁷ In particular, the empirical literature has clearly established that productivity leads to exports, and there might even be feedback effects from exporting (e.g. Van Biesebroeck, 2005).

firms and after an adjustment period. Rincón-Aznar, Riley and Rosso (2015) carry out a similar analysis for UK firms and find a positive impact on sales growth and, to a more limited extent, on labor productivity growth.

Evaluations of export promotion have focused on a single program, while firms often receive assistance in several domains. These other forms of assistance can also affect export outcomes and interact with trade promotion. For instance, innovation subsidies might lead to improved production processes and higher productivity or to new product varieties that facilitate entry into foreign markets. Álvarez, Crespi, and Volpe Martincus (2014) investigate the existence of complementarities between export and innovation promotion programs in shaping Chilean firms' export performance over the 2002-2010 period. They find that firms which previously participated in the innovation promotion program were able to benefit more from subsequent trade promotion than firms only using the latter or using both programs simultaneously (thus not allowing innovation to mature). In other words, the sequencing of programs was important for maximizing their synergies.

In closing this section, we should mention that, albeit there are some clear knowledge gaps, there is a substantial amount of research on the effects of export promotion on export outcomes. Moreover, in the introduction we cited an emerging literature explaining the great trade collapse following the global financial crisis. As of yet, there is no connection between these two literatures. We do not know whether trade promotion contributed to firms' adjustment to the financial turmoil and, if so, to what extent. This is precisely the link that our analysis will explore.

3. EXPORT SUPPORT AGENCIES

3.1. PROMPERU

PROMPERU is Peru's public export promotion organization and is headquartered in Lima.⁸ Its highest governing body is the Board of Directors, which is chaired by the minister of foreign trade and tourism and is composed of representatives from the public and private sectors, such as the Ministry of Foreign Relations, the Ministry of Economy and Finance, the Exporters Association and Peru's Society of Foreign Trade. In addition to the board, PROMPERU's organizational structure consists of a general secretary and two divisions, one for export promotion and one for tourism promotion.

Currently, the agency's budget is \$76.8 million. Annual resources available for the export promotion division are \$18.6 million with most of the budget provided directly by the government. As of September 2015 PROMPERU had 380 employees of which 94 are with the export division. This division has units responsible for market intelligence,

⁸ PROMPERU employees manage six regional offices within Peru which provide local companies with basic training and general information on the export process and foreign markets. In addition, the agency has regional information centers that are staffed and managed by employees of local governments or business associations, which not only organize training activities, but facilitate access to information on marketing, prices of products with overseas demand, profiles of products with greater demand abroad, and export procedures and tax regimes (Volpe Martincus, 2010).

capacity building (export development), and trade promotion. Many employees have previous experience in foreign trade.⁹

PROMPERU's main goal is to contribute to the internationalization of Peruvian firms by fostering their penetration of foreign markets and consolidating their positions in these markets. In pursuing this goal, the organization provides firms with multiple services. It trains inexperienced firms on the export process, marketing, and negotiations; performs and disseminates analyses on country and product market trends; provides specific information on trade opportunities abroad as well as specialized counseling and technical assistance on how to take advantage of these opportunities; coordinates and supports (and sometimes co-finances) firms' participation in international trade missions or fairs and, importantly, arranges meetings with potential foreign buyers; organizes these types of trade events; and sponsors the creation of consortia of firms aiming to strengthen their competitive position in external markets.

3.2. Flanders Investment and Trade (FIT)

In Belgium, export promotion is organized under three regional, government-funded agencies. We use information from the Flemish agency, *Flanders Investment & Trade* (FIT). They serve firms located in Flanders and Brussels which account for more than 80% of Belgian goods trade. If some (multi-plant) firms in our sample receive support from one of the other two regional agencies but we still include them in the control group, it would mitigate the effects we estimate.¹⁰

FIT has its headquarters in Brussels, regional offices in the five provincial capitals and field offices in approximately 90 locations abroad. Its total budget in 2009 was €56.3 million. Most of this, 86%, came directly from the Flemish government, with fee income from services covering around €3 million. Its largest expense is maintaining the network of offices in Belgium and abroad. Almost one quarter of the budget, €13.5 million in 2009, is directed towards matching grants linked to a business trip or participation in a fair. The average grant is quite limited, approximately €2,000 per request.

FIT has provided us with detailed information on the intensity and nature of interactions with each of its clients. In order of importance, as considered by FIT itself, they interact with potential or current exporters using four types of promotion instruments—actions, questions, subsidies, and communications.

The category 'actions' comprises activities outside day-to-day support. They mainly include events that FIT organizes to help firms access markets abroad, such as information seminars in Brussels, prospection tours or trade missions, helping firms to participate in a trade fair, or arranging a meeting with foreign buyers.

⁹ We thank Carlos Diaz from PROMPERU for providing up-to-date budget and employment figures.

¹⁰ We obtained comparable support information from *Brussels Invest & Export*, the agency that serves firms from the Brussels-Capital region, but due to a shorter sample period we cannot include it in the analysis. We did use the information to exclude firms working with both agencies, as described in the data section.

‘Questions’ are requests for information that involve some research by FIT employees (located domestically or abroad). They cover a range of interactions where companies may ask for information on markets or potential partners, or for help setting up an appointment schedule on a business trip or when prospecting a foreign market. Questions are generally transmitted to the field office in the concerned country.

‘Subsidies’ are all forms of financial incentives given to individual companies, which are mostly co-payments to support foreign trips. They also include capital good subsidies and feasibility studies which were previously under the realm of development aid. This category is targeted to small and medium-sized firms.

Finally, ‘communication’ is the category covering the remainder of interactions between FIT and client firms. Examples are confirmations of a lunch appointment with the CEO, a reference to a local consultant, or the submission of a transcript of a FIT lecture about international entrepreneurship.

For each of the four promotion instruments we observe the frequency that each firm used FIT services between 2002 and 2011, but not which export destination the firm was targeting. PROMPERU provides similar types of support, distinguishing between three categories: missions, questions, and other. Unfortunately, the PROMPERU data we received only indicates whether a firm is supported, not the type of support it received. Trade missions and participation in trade fairs tend to play a much larger role than in the operations of FIT.

4. DATA

The literature has only analyzed the average impact of export promotion services, irrespective of the business cycle. It seems plausible, however, that the demand for these services and perhaps even their usefulness is enhanced during cyclical downturns. To investigate this possibility, we use information on export performance and the incidence of support at the firm level for Belgium and Peru.

For both countries we have access to information on all trade transactions for individual firms, broken down by country destination and detailed product level. For Belgium, foreign trade data is available separately for extra-EU transactions from Belgian Customs and for intra-EU transactions through the Intrastat inquiry.¹¹ Exports to destinations outside the EU are recorded at the firm-product-month level for all export flows that exceed a value of €1,000 or a weight of 1,000 kg—in practice even lower trade flows are often observed. In contrast, firms are only required to report their within-EU exports if the combined value across all EU member states exceeds a threshold, which was €250,000 until 2005 but was raised to €1 million in 2006. If this is the case, firms report their exports individually for each product-country pair.

Comparable information from Peruvian Customs is available with even greater product detail. We aggregate trade flows in both countries to the annual frequency and 6-digit product level of the Harmonized System. For Peru we only observe exporters and not

¹¹ Complete information on the Belgian trade datasets can be consulted here: <https://www.nbb.be/en/statistics/foreign-trade>.

the universe of active firms. Hence we focus on survival and continued success on the export market and abstract from export market entry.

We have separate information on which firms benefit from support activities of the respective regional or national export promotion agencies, FIT for firms in Flanders (Belgium), and PROMPERU for firms in Peru. We provided detailed information on the nature of these services in the previous section and below we describe how their use evolved over the recession.

The information from these two data sources is readily matched at the firm-year level using a unique firm identifier. For Belgium we observe the trade information over the entire 1998-2013 period and export support over 2001-2011. The data for Peru covers the 2000-2012 period. To concentrate on the same time period in both countries and work with a sample that has consistent reporting thresholds, most of the analysis is limited to 2006-2011. This period is also ideal for focusing on the effectiveness of export support specifically during the economic crisis, which reduced trade flows primarily in 2009 and 2010.¹² In the descriptive analysis we use one year after the crisis to illustrate the return to normality.

After merging both data sources for each country, we obtain an unbalanced panel of firms. For Belgium, there are 50,581 unique firms and 144,045 firm-year observations in the 2006-2011 period. For Peru the corresponding statistics are 22,747 and 49,197. Table 2 shows the breakdown by export and support status. For Belgium, 13% of exporters receive support, while 55% of firms that receive support are exporters. The number of exporters declined slightly over the sample period, but we do see an uptick in the number of firms receiving support during the crisis years 2009 and 2010. For Peru, a slightly smaller fraction of exporters (10%) receive support, but out of the firms that receive support a much smaller fraction are exporters (only 29%). The vast majority of these trade-inexperienced clients only receive support during a single year.

[Include Table 2 approximately here]

In most of the analysis we limit the sample to firms that export in 2006, with or without support. For Belgium this comprises 23,024 firms and for Peru 6,472 firms, but we only observe complete information for 6,268 of them. Subject to the reporting threshold on trade transactions (in Belgium), this is the universe of exporters in 2006. When we conduct an analysis at the firm-destination, the firm-product, or the firm-destination-product level we observe more observations for this same group of exporters. For example, the Belgian firms served on average 6.1 destinations with 3.0 products for a total of 13.4 product markets per firm in 2006. The extensive margin analysis will rely on all these observations, but at the intensive margin many observations drop out since firms tend to leave some product or destination markets as time progresses.

¹² The datasets used in this paper extend the sample periods used in the work of Schminke and Van Biesebroeck (2015) for Belgium and Volpe Martincus and Carballo (2008) for Peru.

5. EXPORTS AND EXPORT SUPPORT OVER THE CRISIS

5.1. Evolution of exports over the crisis

Before we explore the relationship between export promotion activities and exports, we document the evolution of exports over the crisis and show which dimensions of export performance were most affected. This will provide some insight into the type of firms for which support might be particularly valuable.

Figure 1 shows the evolution of aggregate exports in billions of euros or dollars, which highlights the suddenness of the export collapse in both countries relative to the trend rate of growth. In all figures and tables, we show results for Belgium on the left and for Peru on the right. The rapid recovery of exports back to trend after the recession is equally remarkable as the sudden reduction in 2009. In Belgium the export decline in 2009, relative to trend growth, was 0.22 log-points and in Peru it was 0.24. While GDP was mostly flat after the recession, barely re-starting growth from the lower level, aggregate exports experienced two years of growth rates that were far above trend to make up the lost ground. In both countries, exports were back at their 2008 level by 2010 and by 2011 they were even ahead of the trend, as if the recession never happened. Our objective is to investigate what role export promotion played in this recovery.

[Include Figure 1 approximately here]

To further illustrate the evolution over the crisis, we plot for a number of variables the residual from a regression (in logarithms) on a linear time trend over the 2006-2013 (Belgium) or 2006-2012 (Peru) periods. The two crisis years, 2009 and 2010, are omitted when determining the trend. The lines in the different panels of Figure 2 show the deviation from the trend, illustrating the depth and duration of the trade collapse. In the different panels, the change in aggregate exports is decomposed into separate adjustment margins.

In the top panel of Figure 2, we separately show the change in the number of exporters (dashed line) and the evolution of average exports per firm (solid line). In both countries, the trade reduction was primarily due to lower exports per firm rather than fewer firms exporting. In Belgium, the number of exporters fell by an average of 2.5% per year over the entire 2006-2013 period and this downward trend became somewhat more pronounced between 2008 and 2011. Exports per firm, in contrast, switched from an average annual growth rate of 7.5% to a sudden drop of 14%—or 22% below trend—in 2009. In Peru, the two lines evolve even more differently. The number of exporters was growing gradually over the entire period, while the strong growth in average exports per firm contracted briefly in 2009, but recovered very quickly.

[Include Figure 2 approximately here]

The second panel separately shows the evolution of the number of product markets, export destinations and the average firm-level sales within each product-destination market. Each variable is aggregated over all firms and then purged from the time trend. The trade reduction is primarily due to a within-firm adjustment on the intensive margin: lower exports by market. Only in Peru is there an additional reduction in the number of products exported, but the decline is much less pronounced. This is consistent with the evidence in Haddad, Harrison and Hausman (2010) for a broader range of countries.

One could also trace the evolution of these three variables—number of markets, number of products, and exports per market—at the firm level without aggregating. Using a full set of year dummies in a regression that includes firm-fixed effects captures these growth rates. In Belgium, the firm-level patterns we thus obtain mimic the aggregate evolutions almost perfectly. In Peru, however, the firm-level regressions show a less pronounced drop in exports by market for individual firms. Although the within-market change is still the primary adjustment mechanism, this experience was less uniformly shared by all Peruvian firms.

The bottom panel of Figure 2 illustrates that the export experience for Belgian firms tends to be similar for destinations within or outside the EU. This distinction is potentially important as the reporting threshold is much higher within the EU and for the vast majority of small exporters we only observe exports for destinations outside the EU. The graph suggests that extra-EU exports evolve similarly: they start declining slightly earlier, bottom out slightly lower, but recover at the same rate as within-EU exports.

While the crisis was concentrated in 2009 and the recovery was very swift, the severity of the export decline did vary across sectors and destinations. It is useful to keep in mind that the economies of Belgium and Peru and their average export portfolios do differ. In particular, Peruvian exports contain much less finished manufactured products and are more concentrated in a few sectors. Mining products and non-metal basic manufactures account for more than half of all Peruvian exports. Its top 5 sectors, out of a total of 17, cover 82% of aggregate exports. Belgian exports are dominated by finished manufactured goods and are less concentrated, with the 5 most important sectors only accounting for 47% of aggregate exports.¹³

On the destination side, the reverse pattern holds. Belgium is strongly embedded in a broader EU production network, which accounts for 76% of total exports over this period; 48% even goes to its four immediate neighbors. The fast-growing BRIC countries and other large developing economies receive less than 8% of Belgian exports. In contrast, Peruvian export markets are highly diversified with approximately 19% of exports going to Latin America and the Caribbean, 17% to the United States, 18% to the EU, 15% to China, and 8% to Japan and South Korea combined.

¹³ The most important export categories for Belgium are mineral fuel and four types of finished manufactured goods: pharmaceuticals, transportation equipment, plastic products, and metal articles.

5.2. Export support over the crisis: some facts

We next show how the use of export promotion support from the two agencies has evolved over the crisis.¹⁴ The black solid line in Figure 3 shows the number of firms that draw on these services each year. In Belgium, the number of individual firms supported rose from 3,752 in 2006 to 4,577 in 2011. It increased gradually as the crisis hit and topped out in 2010, 22% above the level of 2006. The general pattern is similar for Peru, but the 50% increase from 2006 to 2009 is much more pronounced and largely predates the export decline.

[Include Figure 3 approximately here]

The dashed line shows the number of new firms that receive support. It only counts firms not supported in 2006, and in the first year we observe them as trade promotion clients. From 2007 to 2008, their number declined in Belgium, but it is likely that some of the “new clients” in 2007 were pre-existing clients that simply skipped using the service in 2006, the first year of our data. The increase in new FIT clients from 2008 to 2010 is likely to be more reliable, but the 7% change from 1,681 to 1,797 is very modest. For Peru, the number of new clients increased in 2008 and similar over-counting in 2007 is likely to understate the increase. From 2008 onwards, the number of new clients unambiguously declined. The adverse international trade environment in 2008-2010 seems to have convinced many firms to postpone their foreign expansion plans.

For Belgium, we observe not only whether a firm uses the service in a particular year, but also the total number of activities it participated in. Firms can draw on each type of services more than once a year and most clients do. The solid grey line in Figure 3 shows the evolution for the sum of activities across all firms. This total usage was 6% higher in 2009 than in 2006, but declined quickly as the crisis subsided. The average number of support instances over the sample period was 5.5 times per firm, falling gradually from 6.0 in 2006 and 2007 to 4.7 in 2010 and 2011. As FIT attracted more marginal, low-use clients, the number of unique firms supported (in black) increased more strongly than the total number of support instances (in grey).

Uniquely for Belgium, again, we even observe the date of support and the dotted line shows the evolution of total support at a quarterly frequency. It reveals that the use of export promotion services is highly seasonal, with a peak in the first quarter of the year. It also reveals that the increase over the crisis is somewhat masked in the annual data. The peaks of the dotted line rise more rapidly than the solid grey line. The same is true for the number of new FIT clients, where the barely noticeable upswing during the recession is more pronounced at the quarterly frequency. Comparing the same quarter, the number of new clients rose by 38% from 490 in 2008Q1 to 676 in 2010Q1 or by 18% from 349 in 2008Q3 to 413 in 2010Q3. Starting from the fourth quarter in 2010, the number of new clients starts declining again.

¹⁴ For Belgium, information for 2011 only covers the first three quarters. Annual use statistics are scaled up to reflect the entire year.

The composition of firms asking for export promotion support also shows a number of patterns over the crisis. Firms that are not (yet) exporting account for an increasing share of total support. This fraction rises from 41% to 49% of all clients in Belgium and from 64% to 71% in Peru. From 2009 onwards, this share declines again. Among Belgian exporters, the use of export support services shifts slightly towards low-volume exporters, firms only serving extra-EU destinations, and firms only exporting a single product or serving only a single destination.

6. EMPIRICAL MODEL

After providing background information on the evolution of exports and the use of export promotion services during the crisis, we now evaluate whether export promotion can be linked to the rapid recovery in export sales that we documented. In principle, three avenues are possible to make causal inferences. If firms select into treatment at least partially based on unobservables that also influence performance, consistent estimation of the treatment effect requires an instrument that is correlated with this selection, but not with the residual in the export performance regression. Van Biesebroeck (2005) and Lileeva and Trefler (2010) are two rare studies using a credible instrument for export market selection, using owner ethnicity and an important trade partner's tariff rates, respectively, but in our datasets no such instrument is available to predict participation in an export promotion program.

A second identification strategy is to conduct a randomized control trial, as used by Atkin, Khandelwal, and Osman (2014) to study the impact that exporting has on firm performance. They split a large purchase order from a foreign buyer into smaller orders and offered them to a random subset of small rug manufacturers in Egypt. As the researchers themselves control the assignment, they generate random variation in export opportunities which guarantees exogenous variation in treatment. While this approach achieves clean identification, it is not without its own problems. It is inherently difficult to generalize from a single experimental study conducted in one specific environment. For example, out of the 149 firms they approached, only 28 agreed to participate and, in a way, enter the export market. Given the very low ex-ante export propensity of the sample population, it is unclear whether this take-up rate can be considered high or low. To keep the costs of the study manageable, micro firms were targeted, but they are quite different from the majority of firms that regular export promotion agencies work with. Finally, contacting a producer with a one-time offer to fulfill one order differs from a typical export promotion intervention aimed at establishing international relationships and opening up avenues for future expansion.¹⁵ Given the challenges in carrying out a project like this, which are well documented in the paper, statistical assumptions are likely to remain our main source of identification.

¹⁵ It should be noted that this study was not designed to learn about export promotion. While informative about the specific setting and the reluctance of small firms to enter the export market, the broader relevance for the effectiveness of export promotion is limited.

The primary identification strategy followed in the existing literature in this area is to invoke the selection-on-observables assumption. A generic performance regression looks like this:

$$y_{it} = \alpha S_{it} + Z_{it}\beta + \gamma_i + \gamma_t + \epsilon_{it}. \quad (1)$$

The α coefficient informs us as to whether firms that receive support ($S = 1$) achieve higher exports (y), conditional on a set of time-varying control variables (Z) and fixed effects (γ). The main challenge to infer causality from this regression is self-selection into treatment by firms with better export potential even in the absence of support. With non-random selection, the support dummy will be correlated with the error term and biased upward.

We follow the standard solution in the export promotion literature and assume that conditional on covariates, selection into treatment is random. More specifically, we assume that the export performance of supported and control firms would have been the same in the absence of support as long as we condition on a sufficiently rich set of observables (Imbens and Wooldridge, 2009). In the potential outcome notation, we assume that $E[y^0|Z, S = 1] = E[y^0|Z, S = 0]$.¹⁶ Combined with the law of iterated expectations, i.e. $E[\cdot] = E_Z\{E[\cdot|Z]\}$, this permits an estimation of the average treatment effect on the treated, defined as $E[y^1 - y^0|S = 1]$.

The so-called selection-on-observables assumption is undeniably restrictive, but in the absence of an instrument or the ability to manipulate selection directly, it is the only way to proceed. It requires that firms' export potential is uncorrelated with the unobservables that compel some firms to request export promotion support while other observationally equivalent firms do not request support. Random exposure to advertisements for the agencies' services could be one such factor, while operating in a location nearby one of the agencies' offices or near a former client's establishment could be another.¹⁷

Imbens and Wooldridge (2009) provide a state of the art overview of how to implement the crucial conditioning. The simplest way is to include the appropriate set of control variables directly in equation (1). They also discuss alternative estimators that often involve estimating a treatment selection model in a first step, which is then used to calculate the propensity score, i.e. the predicted probability of treatment, for all firms. In a second step, matching techniques or probability-weighting can then be used to construct an appropriate performance benchmark for supported firms.¹⁸

To investigate which firm-level observables are correlated with support, we estimate the following selection model:

$$S_{it} = \delta y_{it-1} + Z_{it}\beta + \gamma_i + \gamma_t + \epsilon_{it}. \quad (2)$$

¹⁶ $E[y]$ is the expected export performance and the superscripts 0 and 1 indicate the potential outcomes under either treatment regime for a given firm. Naturally, if a firm is supported we do not observe y^0 and therefore need to estimate it from a group of control firms (which have $S = 0$).

¹⁷ Breinlich, Donaldson, Nolen, and Wright (2015) present evidence from the results of a randomized controlled trial on the role that information plays in firms' perceptions of the benefits and costs of exporting.

¹⁸ Another statistical tool from the treatment evaluation literature, regression discontinuity design, has not been used in this particular literature because in most countries all firms qualify for support.

We first estimate equation (2) using a linear probability model that allows for the inclusion of firm-fixed effects (γ_i) in addition to firm-level covariates (Z) and a time-fixed effect. We also estimate a variant of this model that replaces the firm-fixed effects with additional covariates and sector-fixed effects. The estimates provide direct insights into whether the firms that ask for support are systematically different and whether the timing of support can be linked to observables, including past export performance.¹⁹

The equations we estimate to actually measure the difference in export performance between supported and other firms differs from the generic equation (1) in several respects. They take the following form:

$$I(\text{Exports}_{it} > 0) = \alpha_1 \text{Any_Support}_{it} + Z_{i06}\beta + \gamma_S + \epsilon_{it}, \quad (3)$$

$$\ln(\text{Exports}_{it}) = \alpha_2 \text{Any_Support}_{it} + Z_{i06}\beta + \gamma_S + \epsilon_{it}. \quad (4)$$

Some adjustments are motivated by our specific objectives, and others reflect insights from the preliminary estimates of equations (1) and (2). We discuss them in turn.

We only observe the performance of existing exporters and are only interested in the effectiveness of export promotion during the crisis. Therefore, we limit the sample to firms that were exporting in 2006 and we evaluate how they perform in the years following. Equations (3) and (4) are both estimated on a cross-section of firms and instead of firm and time-fixed effects we now include sector-fixed effects γ_S and for Peru region-fixed effects as well. We consider two dependent variables: a dummy variable for the export status of firm i in year t and, only for the subset of export market survivors, the logarithm of a firm's export level in year t . If supported firms are more likely to survive on the export market, the α_1 coefficient will be positive. Conditioning on export market survival, the α_2 coefficient measures whether client firms are able to export more than firms not receiving support.

We run separate regressions for years $t \in \{2008, 2009, 2010\}$, which makes it straightforward to analyze changes at the extensive and intensive margin in a symmetric way. The treatment variable of interest only focuses on support during the crisis. It indicates whether firm i benefitted from export promotion support at any time between 2007, the year before the start of the global crisis, and year t : $\text{Any_Support}_{it} = \max(\text{Support}_{i07}, \dots, \text{Support}_{it})$.²⁰

We first estimate equations (3) and (4) with ordinary least squares, but to verify robustness we also implement a matching estimator that selects a comparison firm from the non-clients using the propensity score estimated by the following treatment model:

$$\text{Any_Support}_{it} = Z_{i06}\beta + \gamma_S + \epsilon_{it}. \quad (2')$$

¹⁹ We later use a comparable specification, without the firm-fixed effects, to predict the propensity score.

²⁰ Berman et al. (2012) provides evidence that time-to-ship plays an important role during financial crises, making more distant trading relationships more vulnerable. Hence, we look at treatment up to year t , using the year as the performance variable, rather than only looking for effects of lagged treatment.

As a further robustness check we also use the inverse of the propensity score directly to weigh the observations in the regression, which is an estimator that has a double-robust property (Imbens and Wooldridge, 2009). It yields consistent estimates when either the selection model or the treatment model is correctly specified. As the optimal weighting scheme is derived for the linear case, we estimate equation (3) as a linear probability model, assuming a mean-zero and i.i.d., but otherwise unrestricted error term.

Since both performance regressions as well as the selection model only use a cross-section of firms, we cannot use firm or year-fixed effects, and lagged values are also of limited use. Control variables from 2006 that are included in the Z vector include the value of exports as well as the number of products and destinations. The initial export growth (i.e. from 2006 to 2007) and other firm characteristics like an importer dummy (for Belgium), size, and age (for Peru) are other control variables included. One should note that conditioning on positive exports in 2006 already makes supported and control firms more similar than a random selection of firms would be. Our estimates of the generic performance equation (1) reported in Figure 4 suggest that it is important to control for these pre-treatment (and pre-crisis) firm-level variables, particularly for initial growth rate in exports.

Researchers often include firm-fixed effects in the performance regression, which gives the comparison between treated and other firms a difference-in-differences interpretation (e.g. Gorg, Henry and Strobl, 2008; Volpe Martincus and Carballo, 2008). It is then only necessary to make the selection-on-observables assumption conditional on the firm-specific unobservable. Rather than exploiting variation within the firm over time, our preferred approach to identify the treatment effects focuses on the same set of initial exporters, but includes separate observations for each market j that a firm served in 2006. This relies on variation within the firm across markets, rather than across time. We again investigate whether supported firms are more likely to survive and export larger volumes, but we now evaluate it separately for each of the export markets.

In this formulation, we can again include a firm-fixed effect, but only if we observe some variation across markets in the explanatory variable of interest. We introduce this across-market variation by interacting the Any_Support_{it} variable with an indicator X_j to investigate whether market j is likely to experience a particularly strong reduction in exports. Equations (3) and (4) thus become

$$I[\text{Exports}_{ijt} > 0] = \tilde{\alpha}_1 \text{Any_Support}_{it} \times X_j + \gamma_i + \gamma_j + \epsilon_{ijt}, \quad (5)$$

$$\ln(\text{Exports}_{ijt}) = \tilde{\alpha}_2 \text{Any_Support}_{it} \times X_j + \gamma_i + \gamma_j + \epsilon_{ijt}, \quad (6)$$

The firm- and market-fixed effects absorb the uninteracted effects of both variables as well as the earlier control variables Z . The coefficient on the interaction between the two indicators will be positive if support is particularly effective in markets hit the most by the financial crisis.

We implement this approach in three ways. First, we consider different destination markets and use a dummy variable to see whether a country experienced a financial crisis over the same period that we measure export promotion support—the interaction variable is X_{jt} in this case.²¹ Second, we consider different product markets, defined at the 2-digit HS level. Products are considered particularly prone to export reductions if they fall under one of the Broad Economic Classification (BEC) product categories for which Levchenko et al. (2010) measured the largest reduction in trade for the United States or, alternatively, if the average firm in a product category is particularly finance intensive.²² Third, we define markets as destination-product (HS 2-digit) combinations and measure whether each market experienced an above-average reduction in exports in a surrogate country—this being the Netherlands for Belgium and Chile for Peru. In this last case, the j index corresponds to a destination-product interaction.

7. RESULTS

7.1. Preliminary evidence to support the preferred specification

To illustrate which firms ask for export promotion support, we first show results for the linear probability model (2) with a time-varying support dummy as dependent variable. In the first column of Table 3 (for each country) we include several dimensions of firms' lagged export market engagement in the regression, but no firm-fixed effects. As these variables are highly collinear, we find few consistent patterns across the two countries, except for the more frequent use of export promotion by firms that export to many destinations. In Belgium the lagged value of exports and the number of products are negatively correlated with participation in the program, while in Peru exporting a large number of products is positively correlated with participation. Note that if we only include a single dimension of export market engagement, we find a positive and highly significant coefficient in both countries for any possible choice.

[Include Table 3 approximately here]

In columns (3) and (6) we show results that include firm-fixed effects in the regression. We still included lagged variables for export market engagement, value, products, and destinations, but hardly any of these variables have any predictive power for support status when we control flexibly for a firm-level unobservable. The p-values for an F-test of joint insignificance of the three lagged variables is, respectively 0.085 and 0.116, for Belgium and Peru, indicating that the three variables combined have barely any predictive value. Adding two-year lags even raises the p-values for the test of

²¹ We use the union of the country-year specific indicators from Reinhart and Rogoff (2011) and Laeven and Valencia (2012) to measure incidences of banking or financial crises in the 2007-2010 period.

²² The BEC categories with an above-average export reduction are industrial supplies (210,220), fuels and lubricants (310,321,322), capital goods (410), and transport equipment and parts (510,521,530). Following Bricongne et al. (2010), we operationalize the Rajan-Zingales measure of finance intensity on our data by looking at the average ratio of cash flow to value added in each product category.

joint insignificance to 0.267 and 0.411. Self-selection into these programs based on immediately prior performance seems to be rare.

Self-selection based on some unobservable firm type, however, does seem to take place. Simply replacing the firm-fixed effects and one (or two) year lagged values by a lagged support indicator already achieves much of the increase in R2 from column (1) to (3) or from column (4) to (6). The very precisely estimated positive coefficients indicate that there is much persistence in firms' participation.

The coefficients on the firm characteristics do not yield any surprises. Belgian firms that export both within and outside the EU are more likely to ask for support, as do firms that import goods as well. Large Belgian firms are more likely to ask for support, but a firm-fixed effect accounts entirely for this effect. In Peru, by contrast, the time-varying dimension of firm size is still correlated with support, implying that as firms hire more workers, they are simultaneously turning to PROMPERU for assistance to expand abroad.²³

We will include the different dimensions of export market attachment as well as other firm characteristics in all performance regressions. Moreover, we estimate a probit model on the subset of firms included in the performance regressions to calculate the propensity score for each firm, using the same set of control variables as in columns (1) and (4). These estimates are reported in Table A.1 in the Appendix.

A second set of results that informed our preferred performance specification is reported in Figure 4.²⁴ We estimated equation (1), regressing the time-varying export value (in logs) on support, additionally including leads and lags of the support indicator relative to the moment of support (time t), i.e. we replace αS_{it} by a linear combination $\sum_{k=-K}^{+K} \alpha_k S_{it+k}$ with $K=4$ for Belgium and $K=3$ for Peru. By including firm-fixed effects in the regression, exports are normalized to zero in the treatment year. As the sample includes firms that never receive support and the equation includes calendar year dummies, the estimates represent the difference in the evolution of exports for clients relative to non-clients leading up to and following export support.

[Include Figure 4 approximately here]

The black markers with solid lines in Figure 4 are for new clients, i.e. firms that receive export support for the first time at some point during the 2006-2011 period. While these firms record higher exports following their first support instance in both countries, the export trajectory leading up to this year t looks different for new clients. The low level of exports in years $t-4$ to $t-1$, both for Belgian and Peruvian firms, suggests that firms do not show up randomly at the export promotion agencies. Even though the point estimates on the first two lags are often insignificant, which is consistent with the evidence in Table 3, the longer time trend is nevertheless informative.

²³ Due to data availability reasons we measure firm size by the value of fixed assets in Belgium and by total employment in Peru, both in logarithms.

²⁴ The exact coefficient estimates with standard errors are reported in Table A.2 in the Appendix.

The picture is different for continuous exporters. The comparable estimates for the sample of these exporters shown by the dashed lines reveal that lower export levels leading up to treatment are less notable for Belgian firms and entirely absent in Peru.²⁵ Note that these coefficients are estimated more precisely since mature exporters experience less pronounced swings in foreign sales.

Our takeaway from these graphs is that, to be on the safe side, we need to include export growth in the pre-support period as an explicit control in the performance regressions not featuring firm-fixed effects, in addition to the firm characteristics and export market attachment discussed earlier. This finding also motivates the specifications that exploit variation within firms across markets, rather than over time.

7.2. Firm-level performance differences for supported firms

Following the initial evidence that motivated specifications (3) and (4), we report the estimates of firm-level export performance differences for supported and other firms in Table 4. Each coefficient, or set of two coefficients in the case of specification (ii), is estimated using a separate regression. We show separate results for export status and export volume as dependent variables (in the top and bottom panel) and for both Belgium and Peru (left and right). Throughout, the sample consists of firms that were exporting in 2006. All regressions contain control variables for firms' export market attachment in 2006, the growth rate of exports between 2006 and 2007, several firm characteristics, industry-fixed effects, and for Peru additional region-fixed effects. The point estimates for the control variables of one set of regressions are reported in Table A.3 in the Appendix.

The baseline results in line (i) are estimated with ordinary least squares. Of the twelve coefficients on the support variable, all are estimated positively and eleven are statistically significantly different from zero. They indicate that firms receiving support are indeed more likely to continue exporting over the crisis and that their export values are higher than those of control firms.

[Include Table 4 approximately here]

For Belgium, the unconditional probability of export market survival is 65% in 2008 and 55% in 2010. For firms that received export promotion this probability is on average one twentieth higher in 2008 and almost one sixth higher in 2010; see panel (a). These differences are economically large and for Peru they are estimated to be even larger, at one seventh in 2008 and one third in 2010. The control variables, especially prior export growth, indicate that a stronger initial export intensity raises the likelihood of survival on the export market, as expected. Without the firm characteristics, the

²⁵ For Belgium we also observe the intensity that firms use export promotion services within each year. The grey markers show the evolution of exports leading up to and following a spike in support, defined as a doubling in annual support instances (or a tripling in the case that the firm used the services only once in the preceding year). They measure the relative export evolution for existing clients that decide to work more intensively with the export promotion agency. The evolution, including the pre-treatment export growth, is highly similar to that of new clients.

differences between supported and other firms are approximately twice as large, but export promotion is still associated with better performance even after conditioning on observables.

The difference in the level of exports for supported firms, reported in panel (b), is equally large. Relative to control firms, export levels are approximately 20% higher for supported firms. Only in 2008 for Peru is the coefficient much lower and insignificant. Except for this one outlier all point estimates come out remarkably similar.

To accommodate the much higher reporting thresholds for exports within the EU by Belgian firms, the specification reported in line (ii) adds an interaction term between the support dummy and the indicator for firms reporting some intra-EU exports. These firms tend to be a lot larger. The results indicate that the benefits of export support for firm survival come almost entirely from the extra-EU activities that are dominated by smaller exporters. The interaction term is always strongly negative and in the first two years it negates the entire baseline effect. Only for the estimates in 2010 is there a significantly positive difference for intra-EU exporters as well, estimated at 5%—the sum of the point estimates on the uninteracted and interacted support indicators.

There is a difficulty, however, in interpreting these results. The more positive estimates on export market survival for firms only exporting extra-EU could be due to a stronger effect either for more distant destinations or for smaller exporters. As a robustness check, we re-ran the regressions recoding all export-status dummies to zero if the total export value of a firm, combining intra and extra-EU trade, fell below the €1 million threshold. Unfortunately, these results are inconclusive. For 2008 and 2009, the effect on survival for firms also exporting intra-EU is positive and significant, while it is not significantly different from zero for firms only exporting extra-EU. In 2010, the results flip, with positive and significant estimates only for firms exporting solely extra-EU.

If the higher survival probability on extra-EU compared to intra-EU markets is not due to distance, but due to a stronger relationship between export promotion and survival for smaller exporters, the total effect might be underestimated for Belgium. Many small exporters that only serve EU markets might enjoy positive effects of this program, but as their intra-EU exports fall below the reporting threshold, our point estimates on the intra-EU exports only reflect the experience of larger exporters. This sample selection could be one reason why the extensive margin differences for Belgium are estimated to be lower than for Peru.

This interpretation is buttressed by the regressions that weigh observations by their initial export value, reported in line (iii), which lead to slightly lower point estimates on the support indicators. If we consider export value a proxy for firm size, this evidence is consistent with the literature in suggesting that performance differences for supported firms are declining with firm size.

We also used two estimators that achieve the conditioning on observables in a more flexible way and are more robust to misspecification of the functional forms of the performance or selection equations. The estimates in line (iv) use propensity score matching and in line (v) inverse probability weighting to control for self-selection.

These results are in line with the baseline OLS estimates. Supported firms record stronger export performance during the crisis, although in most cases the absolute performance differences are estimated slightly lower with these alternative estimators.

7.3. Effects of export promotion at the extensive and intensive margins

The specifications reported in Table 4 did not allow the inclusion of firm-fixed effects. We next exploit export performance differences at the firm-market level, making it possible to control for an unobservable firm effect when investigating the effects of export promotion support. These estimates control flexibly for a firm's average performance and identify the effect of export promotion solely from the differential performance of the same firm across destination or product markets. The results in the next three tables investigate whether supported firms are more likely to survive and/or export larger volumes than control firms in destinations that are hit by the financial crisis, in product markets that are sensitive to the crisis, or in product-destination markets where firms from a surrogate country experienced a larger than average decline in exports.

The first set of results show that supported firms indeed experience a stronger export performance than control firms precisely in destinations that were hit by a financial crisis. The sample now contains all firm-destination pairs with positive exports in 2006. To get an idea of the overall effect, combining the extensive and intensive margins, we follow a standard approach from the literature of keeping zero-trade observations in the sample and using the logarithm of total exports plus one as dependent variable.²⁶ All original firm-destinations thus remain in the analysis even if a firm exits a particular export market. The implicit assumption is that the marginal effect of support (in percentage terms) is the same at the extensive and intensive margin. These effects, reported in Table A.4 in the Appendix for the current specification as well as the next two, are estimated to be strongly positive in both countries in all three years we consider.²⁷

In the two panels of Table 5, we investigate whether the superior performance of supported firms is due to a higher survival probability in destinations hit by the financial crisis or to a higher export volume in relative terms—in practice, this is likely to mean a smaller reduction in export volume for those destinations. The results unequivocally pinpoint the extensive destination margin as the primary channel responsible for the superior firm-level performance. Supported firms are significantly more likely to remain active in destinations that experienced a financial crisis.

[Include Table 5 approximately here]

²⁶ In practice, we add €100 to Belgian exports (the minimum threshold we used for a trade flow to be included in the sample) and \$100 to Peruvian exports before taking logarithms.

²⁷ These results are based on a specification with a full set of firm and country fixed effects to control flexibly for unobservable differences that affect all firms in a destination or all destinations served by one firm in the same way. Estimating the same model, but using the earlier firm characteristics as controls, we obtained point estimates that are extremely similar to the firm-level intensive margin estimates in Table 4(b), which is intuitive.

For Belgian firms, export volumes are not significantly different between supported and control firms that survive in those destinations. The point estimates at the intensive margin are very close to zero. For Peruvian firms, the three point estimates on the intensive margin in Table 5(b) are positive, but only one is statistically significant at the 10% level. The effects tend to be strongest, both for Belgium and for Peru, in 2009, when the financial crisis and the trade collapse was most pronounced.

The next set of results, reported in Table 6, are estimated on a sample of firm-product observations, where all 2-digit HS product categories that sample firms exported to in 2006 are included as separate observations. It again allows the inclusion of firm-fixed effects to control for a firm-level unobservable that affects all of a firm's products similarly. The effect of export promotion is now identified by interacting the support dummy with an indicator for product categories that we expect to suffer most during the crisis. As explained in Section 6, we used two alternative indicators from the literature to select those products.

The results reported in line (i) characterize products by their type of use—e.g. capital goods, processed intermediates, durable consumption goods—according to the BEC classification. The product categories that experienced the largest trade decline in the United States during the crisis, as reported in Levchenko et al. (2010), are classified as the most crisis-prone. For all the corresponding 2-digit HS products, the indicator X_j in specifications (5) and (6) has been changed to 1.

[Include Table 6 approximately here]

The overall effects of export promotion, in Table A.4(b), are again large and positive for Belgian firms. This is entirely due to a strong and highly significant effect at the extensive product margin, in panel (a) of Table 6, while the difference in export volumes for supported and other firms is not systematically larger for crisis-prone products. Supported firms have a 25% to 34% higher likelihood of continuing to export crisis-prone products.

The point estimates for Peruvian firms are also large overall, but they are much less precise and not statistically different from zero. Recall from the discussion in Section 5 that Peruvian exports are highly concentrated in some sectors. The vast majority of its exports are raw materials and processed intermediates. This is very different from the situation for Belgian firms which are tightly integrated in an EU production network. It is not entirely surprising that the type of product, and thus the stage of the production chain a firm is responsible for, turns out to matter the most for Belgium.

Results reported in line (ii) are obtained from separate regressions, using a different criterion to identify product categories where we expect a disproportionate effect from the crisis. We calculated the cash flow to value added ratio for all active firms prior to the crisis and select 2-digit HS product categories where the average ratio is above the manufacturing average. This approach was suggested by Bricongne et al. (2010) to implement the Rajan-Zingales measure of finance intensity on Amadeus data, which is

similar to the Belgian data we have access to. Because the corresponding firm-level information is not available for Peru, we did not implement this robustness check there.

The results are broadly consistent with those in line (i). A strong overall positive effect is driven entirely by the extensive margin response, while the intensive margin effect is always estimated negatively, most likely due to a change in sample composition, which we discuss below.

In the final set of results, reported in Table 7, the interaction term is switched to 1 if a product-destination market experienced a higher than average reduction in exports during the crisis. To avoid including an endogenous variable on the right-hand side, we estimate this reduction by using the exports of a neighboring country that is similar in size and level of development, the Netherlands for Belgium and Chile for Peru. In the performance regressions we include product-destination interaction fixed effects and again identify the effectiveness of export promotion from the differential performance of supported firms across differentially affected export markets.

[Include Table 7 approximately here]

Once again, the results for Belgium pinpoint the extensive margin as the sole driver for the overall positive effect. All extensive margin coefficients are positive and statistically significant, and even the magnitude of the effects is remarkably consistent across all specifications, from Table 4 to Table 7. The point estimate on the survival probability is 30% in 2008 and 20% in 2010. Note that these coefficients have a double-difference interpretation; namely, the survival difference in strongly affected export markets compared to other markets is 20 to 30% higher for supported firms than for control firms.

In Table 7, the intensive margin estimates for Belgian firms are again negative, but what is notable is that they become statistically significant. While counterintuitive at first, this is not entirely surprising, since the large differences in survival probability from panel (b) change the composition of export relationships in later years. Given that smaller trading relationships have a much greater likelihood of being disrupted, especially for unsupported firms, it is not surprising that the point estimates become negative in panel (c). Any positive trade-boosting effect is swamped by an adverse compositional effect.

For Peru, export promotion improves performance on both margins. Supported firms are relatively more likely to survive on severely affected markets, but they also record relatively higher export volumes. These differences only appear once the crisis hits in full, starting in 2009. Standard errors are a lot larger on the estimates for Peru, which could be due to a less complete production and export overlap between Peru and Chile than between Belgium and the Netherlands. Nevertheless, the intensive margin effects are so large that they are still highly significant in 2009 and 2010.

8. POLICY DISCUSSION

Our estimates provide consistent evidence that firms receiving export promotion support during the crisis performed better. They were more likely to remain active in export markets and they exported higher volumes relative to control firms. The most robust channel for this superior relative performance was the higher likelihood of remaining active exporters in export destinations or in product categories that were most affected by the financial crisis.

In this last section, we take a step back and consider the policy relevance of these findings. In particular, we address the following two questions. Is it likely that systematically scaling up these programs during a cyclical downturn would provide additional benefits? And, are the net benefits of these programs, taking their costs into account, also positive?

A priori, it is unlikely that these programs could become a major policy tool to cushion the business cycle fluctuations that exporters face. The existing programs are minuscule in comparison to aggregate export sales, and the activities they perform are also not easily adapted to provide rapid interventions or adjust with the business cycle. The primary role of these agencies is to act as an information broker and help firms deal with problems of asymmetric information or transaction costs. To accomplish this, they invest in accumulating internal knowledge as well as a foreign network of support offices that is permanently available.

Moreover, most support is initiated by client firms, and pushing support to potential or current exporters is unlikely to generate positive effects of a similar magnitude as those we estimated from the current operations.²⁸ We do not have direct evidence suggesting the programs are capacity-constrained and that increasing their budget would automatically raise the benefits they generate. It is notable, however, that the type of activity that saw the second strongest increase over the crisis period is “Actions,” the category where the agency is most able to take initiative itself, e.g. by organizing seminars or trade missions (this breakdown is only available for Belgium).²⁹

Another caveat is that in the 2009 recession, government deficits soared and budgets were tightened for governmental services existing at that time. Without dedicated funds to adapt their activities, agencies were limited in their response to the crisis. The effects we estimate are from a time period where agencies were especially constrained in engaging in additional activities, given the need to continue covering their fixed costs.

Having said that, a number of patterns we document here are encouraging for the countercyclical potential of export promotion programs. First, effects are particularly strong at the extensive margin. As exporting involves sunk entry costs as well as fixed costs that are incurred each year, providing export promotion support at the precise moment where budgets for recurring fixed costs are tight can avoid inefficient export market churn. The especially robust results at the destination-extensive margin further

²⁸ However, Munch and Schaur (2015) show that positive effects are of a similar magnitude regardless of whether firms take the initiative and request support themselves or the agency selects firms independently.

²⁹ Unsurprisingly, giving the tightened credit constraints, the “Subsidy” category increased the most.

underscore the benefit of export promotion as a way of diversifying sales and helping hedge against local business cycle fluctuations.

Second, along the same lines, estimated effects for Belgium are larger for exports outside the EU, while the vast majority of Peruvian exports leave the region. As business cycles tend to be less synchronized for countries that are farther apart, there is an opportunity to tap into markets where demand is not depressed during a domestic recession.³⁰

Third, the evidence also shows that export promotion especially helped firms survive in export markets that experienced a financial crisis. This is not surprising since exporting tends to be a capital and credit intensive activity. We expected export promotion to be effective in helping firms navigate protectionist measures that often become more popular during cyclical downturns. During the last recession, however, countries were remarkably restrained in this area and we did not find sufficient such instances to test this prediction.

We now turn to the second question. While the results provide strong evidence for a positive impact on firm-level export performance, it is possible that the costs associated with these programs still outweigh the benefits. Carrying out a complete cost-benefit analysis would require detailed information on the variable and fixed costs of providing these services, in particular on the marginal case where support is provided. It would also require an assessment determining to what extent the services merely crowd out private expenses or whether a public program makes it possible that firms avoid duplicating costs. Some of the increased exports might come at the expense of third countries, an issue of particular concern for the EU since it limits state aid, but also to the WTO, which prohibits direct export subsidies. At the benefit side, it would matter greatly whether supported firms are able to reap long-term benefits or not. Perhaps most importantly, the net welfare gain to society from an extra dollar or euro of export sales is hard to determine, but it is likely to be higher during recessions.

We mention two quantitative implications of our point estimates. First, if one interprets the point estimates as causal effects, their magnitudes imply very large gains from these programs in terms of absolute export volumes. For example, using the “crisis-prone” firm-product estimates from Table 6 we calculate that the estimated extensive margin effect alone implies €2.8 billion higher exports of crisis-prone products for treated firms.³¹ The aggregate effects are only slightly smaller in magnitude for 2009 and 2010, at €1.8 and €2.4 billion, but the decline in aggregate exports in those years would require a proportionate downscaling of the program effects. Even if only a small fraction of these marginal export sales represent a welfare gain, netting out the opportunity costs of the resources, it is not implausible that these programs provide a positive return. Especially in a cyclical downturn, anything stimulating effective aggregate demand is valuable.

³⁰ Note, however, that the extra-EU trade flows are subject to a much lower reporting requirement. The stronger effects on survival extra-EU could also be caused by stronger effects of export promotion on smaller exporters.

³¹ The corresponding effects using the estimate based on finance-intensive products (for 2008 and only for treated observations) is €1.4 billion and using the firm-destination estimates it is €4.2 billion.

An alternative approach would be to calculate the immediate return on investment from the government's perspective. On the narrow question, whether the tax revenue on corporate profits generated by the extra exports at least covers the budget of the export promotion agency, we can mostly answer affirmatively. Using the most conservative (lowest) point estimates from Table 4, we calculate the expected increase in exports associated with each trade promotion program from both the extensive and the intensive margin responses. For each country, we multiply this addition to firm sales with the average profit-to-sales ratio and with the corporate tax rate and we subtract the annual operating cost of the agency. We find that the resulting net gain in government revenue in Belgium varies between €3.3 million in 2008 and €36.9 million in 2010. For Peru, the net return turns positive in 2010 at €3.8 million. While this simple cost-benefit calculation indicates that export promotion is currently covering its own costs, the net gain in government revenue remains modest, which is what we would expect.

Given the significantly higher exports for firms participating in these programs as well as their positive net present value, one might wonder whether or not firms could operate them privately, independent from the government. Since the programs are most valuable when they operate at a minimum scale, one difficulty is to overcome coordination costs, making it difficult to roll them out gradually. Operating these programs privately does not seem impossible, as shown in Hiller (2012), which studies a private, non-profit association in Denmark that provides export promotion support to member firms. It is particularly feasible for a larger economy, like Germany, whose *Chambers of Commerce Abroad* network operates 120 offices in 80 countries (in 2013), with more than 1,700 staff to promote German commercial interests.

Even for the programs that remain in the public realm, we definitely observe an increase in the reliance on user fees for funding and pressure to increase this further. Munch and Schaur (2015) study the program operated by the Danish Trade Council, a government agency selling firms export promotion services at subsidized rates that cover approximately 50% of the cost. The Swiss program, Switzerland Global Enterprise, also recovers a significant share of its total budget from fees.

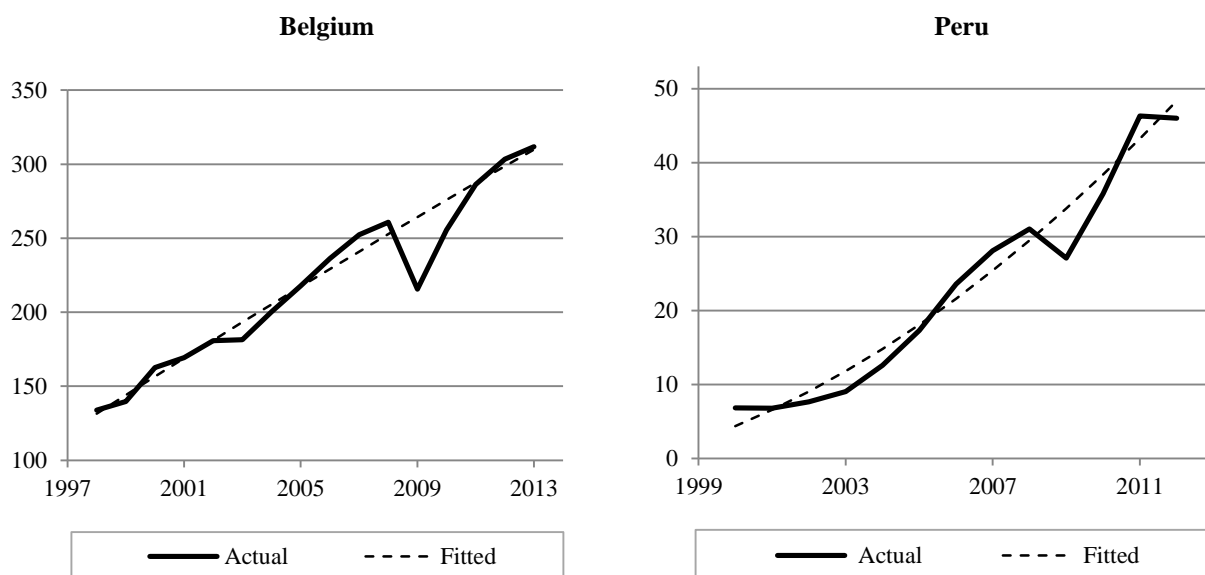
9. REFERENCES

- Abraham, Filip and Gerda Dewit (2000). "Export promotion via official export insurance," *Open Economies Review* 11(1): 5-26.
- Amiti, Mary and David E. Weinstein (2011). "Exports and financial shocks," *Quarterly Journal of Economics* 126(4): 1841-1877.
- Álvarez, Roberto (2004). "Sources of export success in small-and medium-sized enterprises: The impact of public programs," *International Business Review* 13(3): 383-400.
- Álvarez, Roberto and Gustavo Crespi (2000). "Exporter performance and promotion instruments: Chilean empirical evidence," *Estudios de Economía* 27(2): 225-241.
- Álvarez, Roberto, Gustavo Crespi, and Christian Volpe Martincus (2014). "A world of possibilities: Internationalization for productive development," in Gustavo Crespi, Eduardo Fernández-Arias and Ernesto Stein (editors), "Rethinking productive development," IDB, Palgrave Macmillan.
- Atkin, David, Amit K. Khandelwal, and Adam Osman (2014). "Exporting and firm performance: Evidence from a randomized trial," NBER Working paper No. 20690.
- Behrens, Kristian, Gregory Corcos and Giordano Mion (2013). "Trade crisis? What trade crisis?" *Review of Economics and Statistics* 95(2): 702-709.
- Bems, Rudolfs, Robert C. Johnson, and Kei-Mu Yi (2011). "Vertical linkages and the collapse of global trade," *American Economic Review P&P* 101(3): 308-312.
- Berman, Nicolas, Jos é de Sousa, Philippe Martin, and Thierry Mayer (2012). "Time to ship during financial crises," in Francesco Giavazzi and Kenneth D. West (eds.) *NBER International Seminar of Macroeconomics 2012*, University of Chicago Press.
- Bernard, Andrew B. and J. Bradford Jensen (2004). "Why some firms export," *Review of Economics and Statistics* 86(2): 561-569.
- Bown, Chad P. and Meredith A. Crowley (2012). "Import protection, business cycles, and exchange rates: Evidence from the Great Recession," *Journal of International Economics* 90(1): 50-64.
- Breinlich, Holger, Dave Donaldson, Patrick J. Nolen, Greg C. Wright (2015). "Information and attitudes towards exporting – Evidence from a randomized controlled trial," University of Essex.
- Bricongne, Jean-Charles, Lionel Fontagné, Guillaume Gaulier, Daria Taglioni, and Vincent Vicard (2010). "Exports and sectoral financial dependence evidence on French firms during the great global crisis," ECB Working Paper No. 1227.
- Bussi ère, Matthieu, Giovanni Callegari, Fabio Ghironi, Giulia Sestieri, and Norihiko Yamano (2013). "Estimating trade elasticities: Demand composition and the trade collapse of 2008-2009," *American Economic Journal: Macroeconomics* 5(3): 118-151.
- Cadot, Olivier, Ana M. Fernandes, Julien Gourdon, and Aaditya Mattoo (2015). "Are the benefits of export support durable? Evidence from Tunisia," *Journal of International Economics* 97(2): 310-324.
- Cansino, Jos é M., Jaime Lopez-Melendo, Maria del P. Pablo-Romero, and Antonio Sánchez-Braza (2013). "An economic evaluation of public programs for internationalization: The case of the Diagnostic Program in Spain," *Evaluation and Program Planning* 41: 38-46.
- Carballo, Jerónimo (2012). Comment on "Are the benefits of export support durable? Evidence from Tunisia", IDB Conference "The Effects of Trade and Investment Promotion."
- Cassey, Andrew J. (2014). "The location of U.S. state's overseas offices," *Review of International Economics* 22(2): 310-325.
- Castro, Lucio and Daniel Saslavsky (2009). *Cazadores de mercados: comercio y promoción de exportaciones en las provincias argentinas*. Fundación CIPPEC.
- Chor, Davin and Kalina Manova (2012). "Off the cliff and back? Credit conditions and international trade during the global financial crisis," *Journal of International Economics* 87(1): 117-133.
- Copeland, Brian R. (2008). "Is there a case for trade and investment promotion policy?" in Dan Ciuriak (ed.), *Trade Policy Research 2007* (Ottawa: Foreign Affairs and International Trade Canada).
- Coughlin, Cletus C. and Phillip A. Cartwright (1987). "An examination of state foreign export promotion and manufacturing exports," *Journal of Regional Science* 27(3): 439-449.
- Creusen, Harold and Arjan Lejour (2012). "Market entry and economic diplomacy," *Applied Economic Letters* 20(5): 504-507.

- Crozet, Matthieu, Julien Gourdon, Florian Mayneris, Thierry Mayer, and Daniel Mirza (2013). "L'efficacité des dispositifs de soutien à l'exportation," La Lettre du CEPII No. 334.
- Cruz, Marcio (2014). "Do export promotion agencies promote new exporters?" IDB Working Paper Series No. IDB-WP-508.
- Defever, Fabrice and Alejandro Riaño (2014). "Protectionism through exporting: Subsidies with export share requirements in China," mimeo, University of Nottingham.
- Djankov, Simeon, Caroline Freund, and Cong S. Pham (2010). "Trading on time." *Review of Economics and Statistics* 92(1), 166-173.
- Eaton, Jonathan, Marcela Eslava, David Jenkins, C.J. Krizan, and James Tybout (2014) "A Search and Learning Model of Export Dynamics," mimeo.
- Eaton, Jonathan, Samuel Kortum, Brent Neiman and John Romalis (2011). "Trade and the global recession," NBER Working Paper No. 16666.
- Egger, Peter and Thomas Url (2006). "Public export credit guarantees and foreign trade structure: Evidence from Austria," *World Economy* 29(4): 399-418.
- Felbermayr, Gabriel J. and Erdal Yalcin (2013). "Export credit guarantees and export performance: An empirical analysis for Germany," *World Economy* 36(8): 967-999.
- Felbermayr, Gabriel J., Inga Heiland and Erdal Yalcin (2012), "Mitigating liquidity constraints: Public export credit guarantees in Germany," *CESifo Working Paper* No. 3908.
- Ferguson, Shon and Rikard Forslid (2014). "Sizing up the impact of embassies on exports," CEPR Discussion Paper No. 9879.
- Francis, June and Colleen Collins-Dodd (2004). "Impact of export promotion programs on firm competencies, strategies and performance. The case of Canadian high-technology SMEs," *International Marketing Review* 21(5): 474-495.
- Gil-Pareja, Salvador, Rafael Llorca-Vivero, José A. Martínez-Serrano, and Francisco Requena-Silvente (2014). "Regional export promotion offices and trade margins," *Review of World Economics* 151(1): 145-167.
- Girma, Sourafel, Yundan Gong, Holger Görg, and Zhihong Yu (2009). "Can production subsidies explain China's export performance? Evidence from firm-level data," *Scandinavian Journal of Economics* 111(4): 863-891.
- Girma, Sourafel, Holger Görg, and Joachim Wagner (2009). "Subsidies and exports in Germany: First evidence from enterprise panel data," *Applied Economics Quarterly* 55(3): 179-195.
- Görg, Holger, Michael Henry, and Eric A. Strobl (2008). "Grant support and exporting activity," *Review of Economics and Statistics* 90(1): 168-174.
- Gourdon, Julien, Laura Hering, Stéphanie Monjon, and Sandra Poncet (2014). "Incomplete VAT rebates for exporters: How do they affect China's export performance?" mimeo.
- Haddad, Mona, Ann Harrison and Catherine Hausman (2010). "Decomposing the Great Trade Collapse: Products, prices, and quantities in the 2008-2009 crisis." NBER Working Paper No. 16253.
- Hayakawa, Kazunobu, Hyun-Hoon Lee, and Donghyun Park (2014). "Do export promotion agencies increase exports?" *The Developing Economies* 52(3): 241-261.
- Head, Keith and John Ries (2010). "Do trade missions increase trade?" *Canadian Journal of Economics* 43(3): 754-775.
- Helmets, Christian and Natalia Trofimenko (2013). "The Use and Abuse of Export subsidies: Evidence from Colombia," *World Economy* 36(4): 465-486.
- Hiller, Sanne (2012). "Do private export associations promote exports? Evidence from Denmark?" September, mimeo.
- Imbens, Guido W. and Jeffrey M. Wooldridge (2009). "Recent developments in the econometrics of program evaluation," *Journal of Economic Literature* 47(1): 5-86.
- Laeven, Luc and Fabián Valencia (2012). "Systemic banking crises database: An update." IMF Working Paper No. WP/12/163.
- Lederman, Daniel, Marcelo Olarreaga, and Lucy Payton (2010). "Export promotion agencies: do they work?" *Journal of Development Economics* 91(2): 257-265.
- Lederman, Daniel, Marcelo Olarreaga, and Lucas Zavala (2015). "Export promotion and firm entry into and survival in export markets," World Bank Policy Research Paper No. 7400.
- Levchenko, Andrei A., Logan T. Lewis, and Linda L. Tesar (2010). "The collapse of international trade during the 2008-09 crisis: In search of the smoking gun," *IMF Economic Review* 58(2): 214-253.

- Lileeva, Alla and Daniel Trefler (2010). "Improved access to foreign markets raises plant-level productivity... for some plants," *Quarterly Journal of Economics* 125(3): 1051-1099.
- Melitz, Marc J. and Stephen J. Redding (2014). "Heterogeneous firms and trade." In G. Gopinath, E. Helpman, and K. Rogoff (Eds.), *Handbook of International Economics, Volume 4*, North Holland.
- Mion, Giordano and Mirabelle Muïls (2015). "The impact of UKTI trade services on the value of goods exported by supported firms," Final Report to UKTI.
- Moser, Christoph, Thorsten Nestmann, and Michael Wedow (2008). "Political risk and export promotion: Evidence from Germany," *World Economy* 31(6): 781-803.
- Munch, Jakob R. and Georg Schaur (2015). "The effect of export promotion on firm-level performance," mimeo.
- Niepmann, Friederike and Tim Schmidt-Eisenlohr (2015). "International trade, risk and the role of banks," Federal Reserve Bank of New York Staff Reports, No. 633.
- Nitsch, Volker (2007). "State visits and international trade," *World Economy* 30(12): 1797-1816.
- Paravisini, Daniel, Veronica Rappoport, Philipp Schnabl and Daniel Wolfenzon (2015). "Dissecting the effect of credit supply on trade: Evidence from matched credit-export data," *Review of Economic Studies* 82(1): 333-359.
- Reinhart, Carmen and Kenneth Rogoff (2011). "From financial crash to debt crisis," *American Economic Review*, 101(5): 1676-1706.
- Rincón-Aznar, Ana, Rebecca Riley and Anna Rosso (2015). "Evaluating the impact of UKTI trade services on the performance of supported firms," Report to the UKTI, the National Institute for Economic and Social Research.
- Roberts, Mark J. and James R. Tybout (1997). "The decision to export in Colombia: An empirical model of entry with sunk costs," *American Economic Review* 87(4): 545-564.
- Rose, Andrew K. (2007). "The foreign service and foreign trade: embassies as export promotion," *World Economy* 30(1), 22-38.
- Schminke, Annette and Johannes Van Biesebroeck (2013). "Using Export Market Performance to Evaluate Regional Preferential Policies in China," *Review of World Economics* 149(20), 343-367.
- Schminke, Annette and Johannes Van Biesebroeck (2015). "Evaluation of export promotion policies in Belgium," September, mimeo.
- Seringhaus, F. H. Rolf and Guenther Botschen (1991). "Cross-national comparison of export promotion services: the views of Canadian and Austrian companies," *Journal of International Business Studies* 22(1): 115-133.
- Van Biesebroeck, Johannes (2005). "Exporting raises productivity in sub-Saharan African manufacturing firms," *Journal of International Economics* 67(2): 373-391.
- Van Biesebroeck, Johannes, Emily Yu, and Shenjie Chen (2015). "The impact of trade promotion services on Canadian exporter performance," *Canadian Journal of Economics* 48(4).
- Veenstra, Marie-Lise E.H., Mina Yakop, and Peter A. G. van Bergeijk (2010). "Economic diplomacy, the level of development and trade," Discussion papers in diplomacy No. 119.
- Volpe Martincus, Christian (2010). *Odyssey in international markets: An assessment of the effectiveness of export promotion in Latin America and the Caribbean*. Special Report on Integration and Trade, Inter-American Development Bank., Washington, DC.
- Volpe Martincus, Christian and Jerónimo Carballo (2008). "Is export promotion effective in developing countries? Firm-level evidence on the intensive and the extensive margins of exports," *Journal of International Economics* 76(1): 89-106.
- Volpe Martincus, Christian and Jerónimo Carballo (2010a). "Export promotion: Bundled services work better," *World Economy* 33(12): 1718-1756.
- Volpe Martincus, Christian and Jerónimo Carballo (2010b). "Beyond the average effects: The distributional impacts of export promotion programs in developing countries," *Journal of Development Economics* 92(2): 201-214.
- Volpe Martincus, Christian and Jerónimo Carballo (2010c). "Entering new country and product markets: does export promotion help?" *Review of World Economics* 146(3): 437-467.
- Volpe Martincus, Christian and Jerónimo Carballo (2012). "Export promotion activities in developing countries: What kind of trade do they promote?" *Journal of International Trade and Economic Development* 21(4): 539-578.
- Volpe Martincus, Christian, Jerónimo Carballo, and Pablo M. Garcia (2012). "Public programmes to promote firms' exports in developing countries: Are there heterogeneous effects by size categories?" *Applied Economics* 44(4): 471-491.

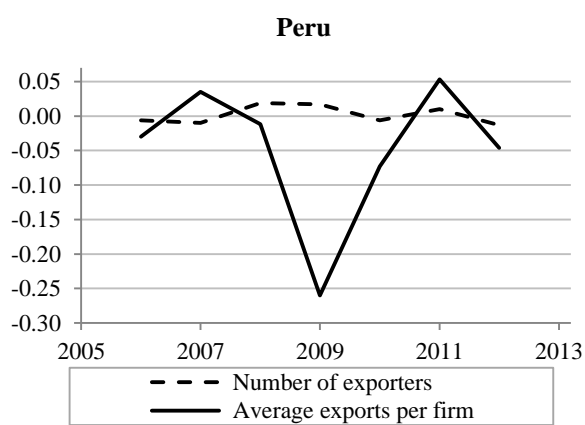
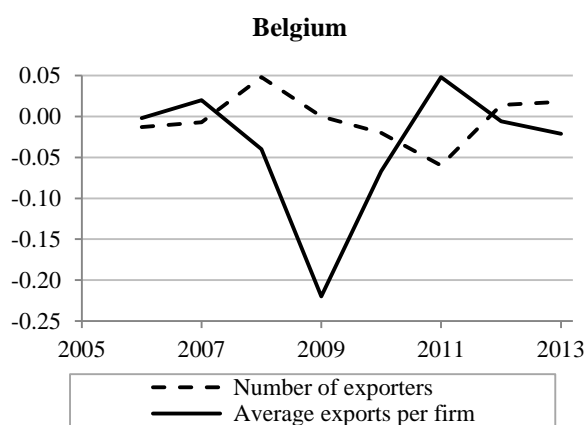
Volpe Martincus, Christian, Jerónimo Carballo, and Alejandro Graziano (2015). "Customs," *Journal of International Economics* 96(1): 119-137.



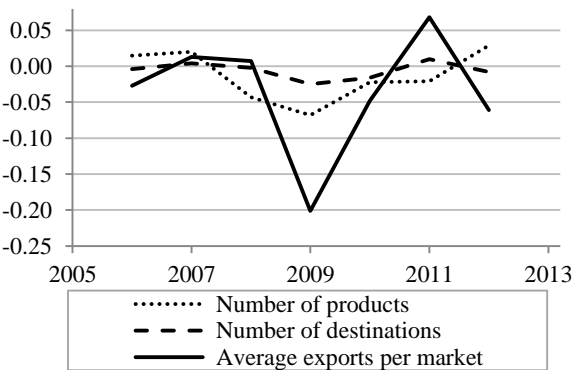
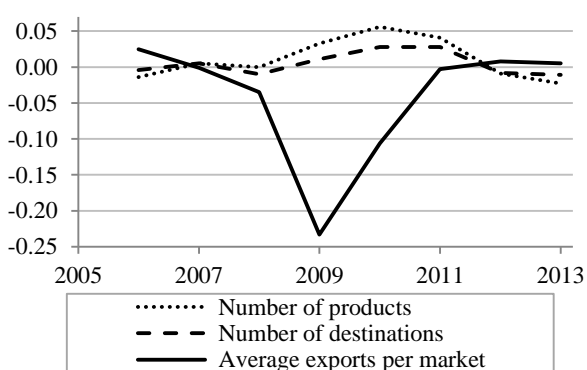
Notes:

Belgium: 1998-2013, in billions of EUR; Peru 2000-2012, in billions of USD.

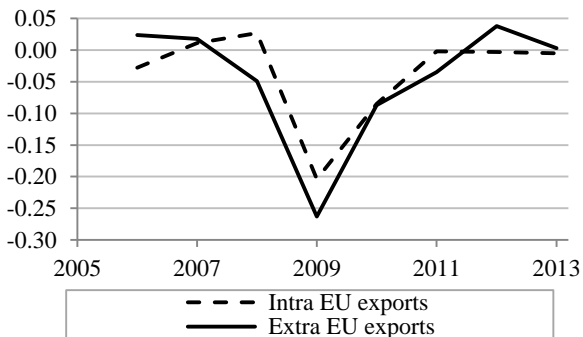
Figure 1. Long-term evolution of aggregate exports



(a) Extensive versus intensive firm margin



(b) Extensive versus intensive product or destination margin



(c) Intra-region versus distant exports

Figure 2. Evolution of exports over the crisis by adjustment margin or destination

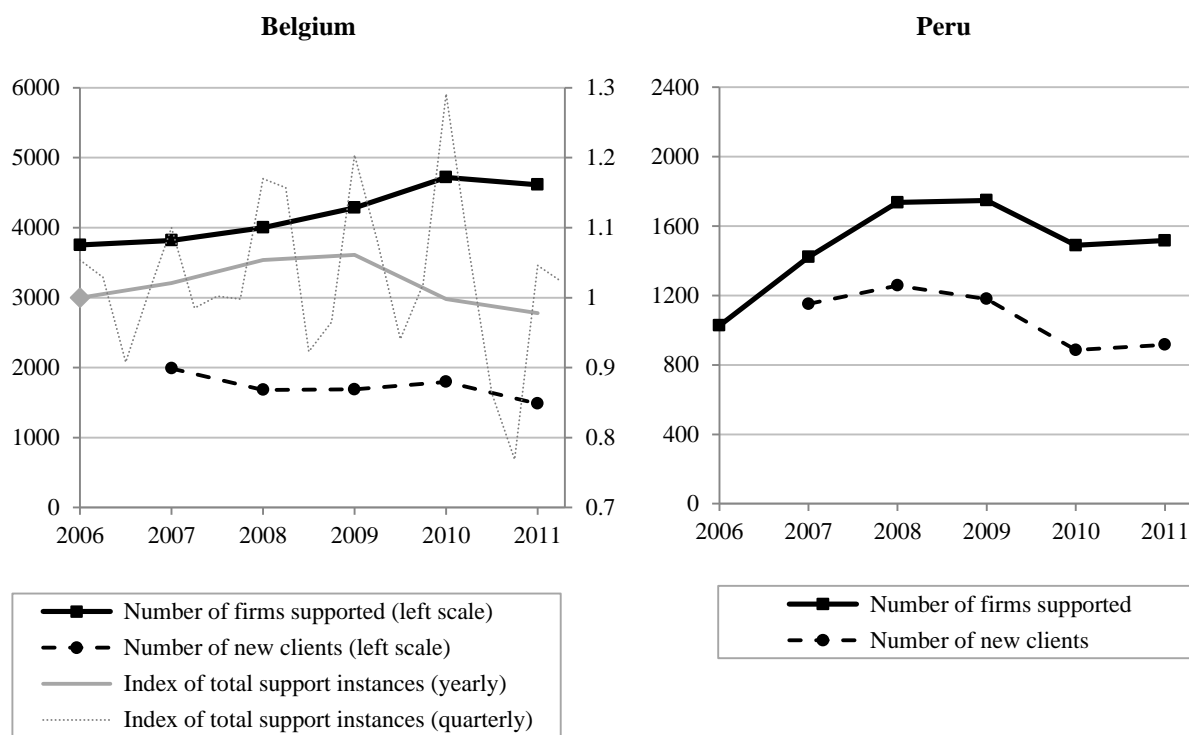
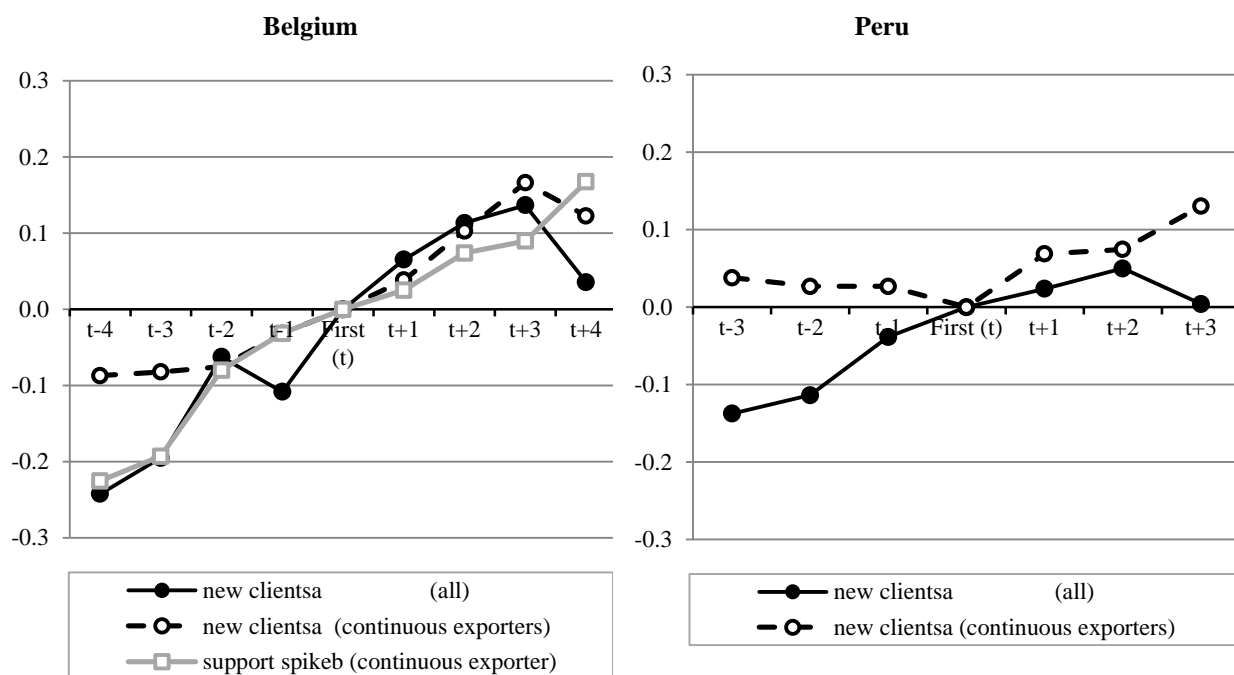


Figure 3. Evolution of export promotion activities over the crisis



Notes:

New clients refer to support instances that are a firm's first in the 2006-2011 period. A support spike is a doubling of support instances in a year; for firms only receiving support once, a spike is only registered if support at least triples. Regressions include firm, sector, year-fixed effects and other controls. Coefficient errors and standard errors are reported in Table A.1 in the Appendix.

Sources: Own calculations based on matched firm-level information from administrative trade-transactions datasets from each country and supported-client datasets from each export promotion agency.

Figure 4. Evolution of exports prior and following export promotion instances

Table 1: Summary of the literature evaluating the impact of export promotion programs

Country	Study
<i>Macro Perspective</i>	
Export Promotion Measure: Financial Resources Devoted to Export Promotion	
Argentina	Castro and Saslavsky (2009)
United States	Coughlin and Cartwright (1987)
United States	Bernard and Jensen (2004)
Cross-country	Lederman, Olarreaga and Payton (2010)
Export Promotion Measure: Network of Foreign Offices	
Japan	Hayakawa, Lee and Park (2014)
Netherlands	Creusen and Lejour (2012)
South Korea	Hayakawa, Lee and Park (2014)
Spain	Gil-Pareja, Llorca-Vivero, Martínez-Serrano, and Requena-Silvente (2014)
United States	Cassey (2014)
Cross-country	Volpe Martincus, Estevadeordal, Gallo, and Luna (2010)
Cross-country	Volpe Martincus, Carballo, and Gallo (2011)
<i>Micro Perspective</i>	
The Impact of Firm-Level Export Promotion on Firms Export Outcomes	
Argentina	Volpe Martincus, Carballo and Garcia (2012)
Austria	Seringhaus and Botschen (1991) ^a
Belgium	Schminke and Van Biesebroeck (2015)
Brazil	Cruz (2014)
Canada	Seringhaus and Botschen (1991)
Canada	Francis and Collins-Dodd (2004) ^a
Canada	Van Biesebroeck, Yu, and Chen (2015)
Chile	Álvarez and Crespi (2000)
Chile	Álvarez (2004)
Chile	Volpe Martincus and Carballo (2010b)
Colombia	Volpe Martincus and Carballo (2010a)
Costa Rica	Volpe Martincus and Carballo (2012)
France	Crozet, Mayer, Mayneris, and Mirza (2013)
Peru	Volpe Martincus and Carballo (2008)
Spain	Cansino, Lopez-Melendo, Pablo-Romero, and Sanchez-Braza (2013)
Tunisia	Cadot, Fernandes, Gourdon, and Mattoo (2015)
United Kingdom	Mion and Muñiz (2015)
Uruguay	Volpe Martincus and Carballo (2010c)
Cross-country	Volpe Martincus (2010)
Cross-country	Lederman, Olarreaga and Zavala (2015)
The Impact of Firm-Level Export Promotion: New Dimensions	
Denmark	Munch and Schaur (2015)
United Kingdom	Rincón-Aznar, Riley and Rosso (2015)
Chile	Álvarez, Crespi, and Volpe Martincus (2014)

Notes:

^a Effectiveness is gauged from firms' responses to a survey.

Table 2: Composition of the sample

	Belgium			Peru		
	Number of firms that			Number of firms that		
	Only export	Only receive support	Export & support	Only export	Only receive support	Export & support
Observations:						
2006	20,824	1,552	2,200	6,101	656	371
2007	20,535	1,609	2,210	6,252	1,001	420
2008	21,384	1,752	2,249	6,639	1,228	508
2009	19,819	1,983	2,302	6,862	1,188	560
2010	18,878	2,288	2,432	7,033	999	490
2011	18,034	1,919	2,075	7,373	937	579
2006-2011	119,474	11,103	13,468	40,260	6,009	2,928
Firms:						
2006-2011	40,027	4,761	5,793	16,330	4,586	1,831

Sources: Own calculations based on matched firm-level information from administrative trade-transactions datasets from each country and supported-client datasets from each export promotion agency.

Table 3: Selection of firms into treatment

dependent variable is a time-varying dummy variable for export promotion support						
	Belgium			Peru		
	2006-2010			2006-2010		
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged support		0.609*** (0.007)			0.459*** (0.016)	
Export growth in 2006-07	0.003 (0.002)	0.001* (0.001)		0.003 (0.002)	0.002 (0.002)	
Export value (log) (t-1)	-0.010*** (0.001)	-0.004*** (0.001)	0.002* (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.003)
No. of products (log) (t-1)	-0.009*** (0.002)	-0.004*** (0.001)	0.002 (0.003)	0.020*** (0.003)	0.013*** (0.002)	0.001 (0.005)
No. of destinations (log) (t-1)	0.080*** (0.003)	0.029*** (0.001)	-0.001 (0.003)	0.049*** (0.006)	0.031*** (0.004)	0.014** (0.007)
Export intra & extra region	0.040*** (0.005)	0.018*** (0.003)	0.011*** (0.004)			
Importer dummy	0.013*** (0.004)	0.008*** (0.002)	0.013*** (0.004)			
Size	0.009*** (0.001)	0.003*** (0.0003)	0.0002 (0.0011)	0.005** (0.002)	0.003** (0.001)	0.017*** (0.004)
Age				-0.003 (0.006)	-0.002 (0.004)	0.027 (0.020)
Region FE	No	No	No	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	No	No	Yes
p-value for F-test of joint significance of all lagged variables	0.000	0.000	0.085	0.000	0.151	0.116
R-squared (overall)	0.116	0.450	0.704	0.059	0.217	0.550
R-squared (within)			0.002			0.004
Number of observations	63,124	63,124	63,124	15,563	15,563	15,563

Notes:

Linear probability model estimated on firms that were exporting in 2006. Standard errors (in brackets) are clustered by firm.

Sources: Own calculations based on matched firm-level information from administrative trade-transactions datasets from each country and supported-client datasets from each export promotion agency.

Table 4: Firm-level estimates of export performance differences for supported firms**(a) Firm extensive margin**

dependent variable is a binary export status indicator (0/1) at the firm level for year t						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
Coefficient on "Supported at least once in [2007, t]"						
(i) OLS estimates	0.033*** (0.010)	0.048*** (0.010)	0.080*** (0.008)	0.074*** (0.014)	0.133*** (0.015)	0.154*** (0.016)
(ii) Supported (uninteracted effect)	0.116*** (0.015)	0.113*** (0.007)	0.130*** (0.013)			
Supported * some exports within-EU	-0.121*** (0.022)	-0.093*** (0.016)	-0.080*** (0.015)			
(iii) Weighted regression	0.024*** (0.005)	0.041*** (0.006)	0.073*** (0.007)	0.074*** (0.012)	0.122*** (0.014)	0.149*** (0.015)
(iv) Propensity score matching	0.041*** (0.009)	0.066*** (0.009)	0.086*** (0.010)	0.068*** (0.013)	0.113*** (0.015)	0.131*** (0.016)
(v) Inverse probability weighting with regression adjustment	0.042*** (0.005)	0.052*** (0.006)	0.078*** (0.007)	0.082*** (0.013)	0.126*** (0.014)	0.141*** (0.015)
Number of observations	23,024	23,024	23,024	6,268	6,268	6,268

(b) Firm intensive margin

dependent variable is log of firm-level exports for export market survivors in year t						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
Coefficient on "Supported at least once in [2007, t]"						
(i) OLS estimates	0.184*** (0.027)	0.249*** (0.034)	0.172*** (0.041)	0.033 (0.055)	0.185*** (0.058)	0.206*** (0.064)
(iii) Weighted regression	0.154*** (0.026)	0.217*** (0.029)	0.150*** (0.036)	0.036 (0.048)	0.172*** (0.051)	0.189*** (0.062)
(iv) Propensity score matching	0.208*** (0.071)	0.195*** (0.067)	0.242*** (0.073)	-0.044 (0.078)	0.225*** (0.063)	0.134* (0.081)
(v) Inverse probability weighting with regression adjustment	0.166*** (0.028)	0.237*** (0.032)	0.172*** (0.038)	0.000 (0.051)	0.148*** (0.054)	0.163*** (0.062)
Number of observations	14,958	13,743	12,742	3,495	3,015	2,658

Notes:

(a) Sample of exporters in 2006, linear probability model.

(b) Sample of 2006 exporters that still export in year t .

Coefficients on the included control variables are reported in Table A.2 in the Appendix for the specification in (ii). The propensity score used in the estimators in (iii) and (iv) is calculated based on the probit regressions reported in Table A.1.

Sources: Own calculations based on matched firm-level information from administrative trade-transactions datasets from each country and supported-client datasets from each export promotion agency.

Table 5: Effect of export promotion at the firm-destination level during the crisis**(a) Extensive margin**

dependent variable is a binary export status indicator (0/1) at the firm-destination level (ij) for year t						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
Interaction: Firm i supported at least once & country j financial crisis in [2007, t]	0.014** (0.007)	0.024*** (0.007)	0.007 (0.007)	0.037 (0.026)	0.044** (0.021)	0.053** (0.021)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	141,189	141,189	141,189	16,092	16,092	16,092

(b) Intensive margin

dependent variable is log of firm-destination export level (ij) for export market survivors in year t						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
Interaction: Firm i supported at least once & country j financial crisis in [2007, t]	-0.015 (0.047)	-0.020 (0.047)	-0.036 (0.048)	0.168 (0.161)	0.262* (0.152)	0.128 (0.170)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	91,207	83,062	76,538	8,182	7,049	6,333

Notes:

Destination countries are classified as experiencing a financial crisis if the country-year specific indicators from Reinhart and Rogoff (2011) or Laeven and Valencia (2012) indicated a banking or financial crises in the 2007- t period. Standard errors (in brackets) are clustered by firm.

Table 6: Effect of export promotion at the firm-product level during the crisis**(a) Extensive margin**

dependent variable is a binary export status indicator (0/1) at the firm-product level (<i>ij</i>) for year <i>t</i>						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
(i) Interaction: Firm <i>i</i> supported at least once & product <i>j</i> is crisis-prone (Levchenko et al.)	0.342** (0.013)	0.295*** (0.012)	0.248*** (0.012)	0.068 (0.064)	-0.004 (0.053)	-0.041 (0.046)
(ii) Interaction: Firm <i>i</i> supported at least once & product <i>j</i> is finance-intensive (Ranjan-Zingales)	0.203*** (0.011)	0.172*** (0.011)	0.142*** (0.010)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	68,040	68,040	68,040	20,001	20,001	20,001

(b) Intensive margin

dependent variable is log of firm-product export level (<i>ij</i>) for export market survivors in year <i>t</i>						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
(i) Interaction: Firm <i>i</i> supported at least once & product <i>j</i> is crisis-prone (Levchenko et al.)	0.027 (0.119)	-0.138 (0.119)	-0.116 (0.118)	-0.032 (0.673)	0.753 (0.599)	1.057 (0.680)
(ii) Interaction: Firm <i>i</i> supported at least once & product <i>j</i> is finance-intensive (Ranjan-Zingales)	0.097 (0.096)	-0.146 (0.097)	-0.186* (0.097)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	42,391	39,114	36,375	8,400	7,033	6,250

Notes:

Each panel reports the results on two different interaction terms which are estimated using separate regressions. The sample and level of analysis is the same, but the indicator variables to identify which HS 2-digit product categories are most affected by the crisis is different.

(i) Products are classified as crisis-prone if they fall in one of the Broad Economic Classification (BEC) product categories with larger than average reduction in trade over the crisis for the United States (Levchenko et al., 2010), namely industrial supplies (210,220), fuels and lubricants (310,321,322), capital goods (410), and transport equipment and parts (510,521,530).

(ii) Products are classified as finance intensive if the average ratio of cash flow to value added across all firms in a product category is higher than average (see Bricongne et al., 2010).

Standard errors (in brackets) are clustered by firm.

Table 7: Effect of export promotion at the firm-product-destination level during the crisis**(a) Extensive margin**

dependent variable is a binary export status indicator (0/1) at the firm-product-destination level (ij) for year t						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
Interaction: Firm i supported at least once & product-destination j experienced a steep export reduction	0.301*** (0.007)	0.247*** (0.007)	0.208*** (0.006)	0.012 (0.036)	0.058** (0.027)	0.043* (0.025)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	308,762	308,931	309,012	35,126	35,126	35,126

(b) Intensive margin

dependent variable is log of firm-product-destination export level (ij) for export market survivors in year t						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
Interaction: Firm i supported at least once & product-destination j experienced a steep export reduction	-0.069** (0.028)	-0.062** (0.029)	-0.070** (0.030)	0.022 (0.391)	0.710** (0.339)	1.141*** (0.359)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	191,561	172,895	159,107	13,701	11,384	10,179

Notes:

Product-destinations are classified as experiencing a steep export reduction if the export reduction over the crisis for the same product-destination market in the Netherlands (for Belgium) or Chile (for Peru) was higher than average. Standard errors (in brackets) are clustered by firm.

Table A.1. Probit estimate of the selection regression used to calculate the propensity score

dependent variable is a binary support indicator at the firm level for any export support in the [2007, t] interval						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1)	(2)	(3)	(4a)	(5a)	(6a)
Export value in 2006 (log)	-0.043*** (0.007)	-0.039*** (0.007)	-0.035*** (0.007)	0.025* (0.013)	0.021* (0.012)	0.029** (0.012)
Export growth in 2006-2007	0.051*** (0.013)	0.053*** (0.012)	0.052*** (0.011)	0.308*** (0.026)	0.308*** (0.023)	0.312*** (0.022)
Number of products in 2006 (log)	-0.056*** (0.014)	-0.059*** (0.013)	-0.061*** (0.013)	0.110*** (0.024)	0.133*** (0.022)	0.127*** (0.022)
Number of destination in 2006 (log)	0.396*** (0.019)	0.379*** (0.018)	0.357*** (0.018)	0.139*** (0.041)	0.206*** (0.038)	0.232*** (0.037)
Export intra & extra region	0.120*** (0.034)	0.135*** (0.033)	0.165*** (0.032)			
Importer dummy	0.352*** (0.043)	0.375*** (0.040)	0.389*** (0.038)			
Size	0.055*** (0.006)	0.056*** (0.005)	0.053*** (0.005)	0.021 (0.016)	0.029** (0.015)	0.030** (0.014)
Age				0.125** (0.049)	0.185*** (0.046)	0.219*** (0.045)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	No	No	No	Yes	Yes	Yes
Number of observations	23024	23024	23024	6,268	6,268	6,268

Table A.2. Coefficient estimates underlying Figure 4

Year relative to first support	Belgium						Peru			
	new clients ^a (all)		new clients ^a (continuous exporters)		support spike ^b (continuous exporter)		new clients ^a (all)		new clients ^a (continuous exporters)	
	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.	Coef.	Std. err.
t-4	-0.242	0.072	-0.087	0.065	-0.225	0.077				
t-3	-0.195	0.055	-0.082	0.052	-0.193	0.057	-0.137	0.067	0.038	0.058
t-2	-0.062	0.045	-0.075	0.044	-0.080	0.048	-0.114	0.055	0.027	0.047
t-1	-0.108	0.038	-0.032	0.038	-0.031	0.043	-0.038	0.050	0.027	0.046
First (t)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
t+1	0.065	0.038	0.038	0.040	0.025	0.044	0.024	0.050	0.069	0.044
t+2	0.113	0.043	0.103	0.043	0.074	0.047	0.050	0.060	0.075	0.048
t+3	0.137	0.050	0.166	0.048	0.090	0.054	0.004	0.084	0.130	0.071
t+4	0.036	0.064	0.123	0.058	0.168	0.070				

Notes:

The dependent variable is log(exports) and all regressions include firm, sector, year fixed effects and controls for size, importer dummy, dummy for exports within and outside the region.

^a New clients refer to support instances that are a firm's first in the 2006-2011 period.

^b A support spike is a doubling of support instances in a year (not observed in Peru); for firms only receiving support once, a spike is only registered if support at least triples.

Source: Own calculations based on matched firm-level information from administrative trade-transactions datasets from each country and supported-client datasets from each export promotion agency.

Table A.3. Complete regression results for specification (i) or (ii) of Table 4
(Firm-level estimates of export performance differences for supported firms)

(a) Firm extensive margin

	dependent variable is a binary export status indicator (0/1) at the firm level for year t					
	Belgium (ii)			Peru (i)		
	t=2008 (1a)	t=2009 (2a)	t=2010 (3a)	t=2008 (4a)	t=2009 (5a)	t=2010 (6a)
Supported at least once in 2007-2008	0.033*** (0.010)			0.074*** (0.014)		
Supported at least once in 2007-2009		0.048*** (0.010)			0.133*** (0.015)	
Supported at least once in 2007-2010			0.080*** (0.008)			0.154*** (0.016)
Export value in 2006 (log)	0.033*** (0.002)	0.028*** (0.003)	0.022*** (0.002)	0.034*** (0.002)	0.026*** (0.002)	0.018*** (0.002)
Export growth in 2006-2007	0.188*** (0.006)	0.171*** (0.006)	0.156*** (0.006)	0.179*** (0.005)	0.137*** (0.005)	0.113*** (0.005)
Number of products in 2006 (log)	0.028*** (0.006)	0.026*** (0.006)	0.029*** (0.008)	0.032*** (0.004)	0.030*** (0.005)	0.027*** (0.005)
Number of destination in 2006 (log)	0.035* (0.019)	0.038*** (0.018)	0.039*** (0.015)	0.004 (0.007)	0.004 (0.009)	0.009 (0.009)
Export intra & extra region	0.008 (0.018)	0.047*** (0.018)	0.054*** (0.018)			
Importer dummy	0.065*** (0.021)	0.090*** (0.021)	0.096*** (0.021)			
Size in 2006 (log)	-0.006** (0.002)	-0.001 (0.002)	0.004** (0.002)	0.003 (0.003)	0.021*** (0.003)	0.031*** (0.003)
Age in 2006 (log)				0.169*** (0.007)	0.184*** (0.007)	0.188*** (0.007)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	No	No	No	Yes	Yes	Yes
Number of observations	23,024	23,024	23,024	6,268	6,268	6,268

Table A.3 (continued)

(b) Firm intensive margin

dependent variable is log of firm-level exports for export market survivors in year t						
	Belgium (ii)			Peru (i)		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
Supported at least once in 2007-2008	0.184*** (0.027)			0.033 (0.055)		
Supported at least once in 2007-2009		0.249*** (0.034)			0.185*** (0.058)	
Supported at least once in 2007-2010			0.172*** (0.041)			0.206*** (0.064)
Export value in 2006 (log)	0.881*** (0.011)	0.816*** (0.013)	0.795*** (0.017)	0.770*** (0.020)	0.711*** (0.022)	0.696*** (0.024)
Export growth in 2006-2007	1.152*** (0.026)	0.966*** (0.031)	0.915*** (0.037)	0.697*** (0.034)	0.565*** (0.038)	0.463*** (0.040)
Number of products in 2006 (log)	-0.008 (0.016)	0.003 (0.020)	0.023 (0.022)	-0.097*** (0.020)	-0.149*** (0.023)	-0.168*** (0.027)
Number of destination in 2006 (log)	-0.014 (0.019)	-0.069*** (0.022)	-0.106*** (0.026)	0.113*** (0.036)	0.112*** (0.041)	0.151*** (0.051)
Export intra & extra region	0.429*** (0.047)	0.703*** (0.063)	0.666*** (0.055)			
Importer dummy	0.188*** (0.042)	0.245*** (0.064)	0.319*** (0.061)			
Size	0.019*** (0.005)	0.042*** (0.009)	0.058*** (0.011)	0.127*** (0.018)	0.197*** (0.019)	0.236*** (0.022)
Age				0.044 (0.057)	-0.107 (0.066)	-0.143* (0.082)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	No	No	No	Yes	Yes	Yes
Number of observations	14,958	13,743	12,742	3,495	3,015	2,658

Notes:

(a) Sample of exporters in 2006, linear probability model.

(b) Sample of 2006 exporters that still export in year t .

Source: Own calculations based on matched firm-level information from administrative trade-transactions datasets from each country and supported-client datasets from each export promotion agency.

Table A.4. Total effect of export promotion during the crisis estimated at the firm-market level**(a) Firm-destination total margin**

dependent variable is $\log(\text{exports}_{ijt}+1)$, j = destination market						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)
Interaction: Firm i supported at least once & country j financial crisis in [2007, t]	0.347*** (0.084)	0.500*** (0.084)	0.344*** (0.091)	0.690** (0.329)	0.801*** (0.281)	0.874*** (0.269)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	141,189	141,189	141,189	16,092	16,092	16,092

(b) Firm-product total margin

dependent variable is $\log(\text{exports}_{ijt}+1)$, j = product market						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1b)	(2b)	(3b)	(4b)	(5b)	(6b)
(i) Interaction: Firm i supported at least once & product j crisis-prone (Levchenko et al.) ^a	3.818*** (0.164)	3.152*** (0.157)	2.664*** (0.155)	0.818 (0.764)	-0.177 (0.657)	-0.634 (0.581)
(ii) Interaction: Firm i supported at least once & product j finance-intensive (Ranjan-Zingales) ^b	2.291*** (0.138)	1.893*** (0.134)	1.562*** (0.126)			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	68,040	68,040	68,040	20,001	20,001	20,001

(c) Firm-product-destination total margin

dependent variable is $\log(\text{exports}_{ijt}+1)$, j = product-destination market						
	Belgium			Peru		
	t=2008	t=2009	t=2010	t=2008	t=2009	t=2010
	(1c)	(2c)	(3c)	(4c)	(5c)	(6c)
Interaction: Firm i supported at least once & product-destination j experienced a steep export reduction	3.032*** (0.073)	2.469*** (0.066)	2.103*** (0.065)	0.494 (0.411)	0.933*** (0.317)	0.981*** (0.304)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-destination FE	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	308,762	308,931	309,012	35,126	35,126	35,126

Notes:

The classification of countries that experienced a financial crisis in panel (a) is the same as in Table 5, the classification of crisis-prone or finance-intensive products in panel (b) is the same as in Table 6, the classification of product-destinations that experienced a steep export reduction in panel (c) is the same as in Table 7.