

Domestic Spillovers and Foreign Networks in Exporting*

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Abstract

We explore how two separate effects impact an export's firm's choice of new export destinations. The first effect, Domestic Spillovers, occurs when other domestic firms export a good to a given country. The second, Foreign Networks, refers to links to other countries via a firm's trading partners. Using data from Colombian exporting firms, which we matched with data from their Chilean counterpart importing and exporting firms, from 2007-2016, we show that both effects matter and that they amplify each other. Together, these effects have a greater impact on a firm's choice of new export destinations than geographic proximity measures, import and export growth, and market size combined. We further show that Domestic spillovers are relatively more important than Foreign Networks. This is particularly true for identifying persistent exporters, which export to a new destination for more than a year.

Keywords: Firm-level, Spillover, Networks, Trade.

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1 Introduction

Expanding to new foreign markets is important for export diversification and economic growth (Hausmann and Rodrik, 2003). However, the expansion process is subject to sizeable information uncertainty and risk. To alleviate this risk, firms often use three strategies. First, they study the exports of other domestic firms, which is termed the Domestic Spillover effect (Greenaway et al., 2004; Silvente and Giménez, 2007; Koenig et al., 2010). Second, they leverage their own experiences by employing so-called Sequential Exporting strategy (Eaton et al., 2009; Albornoz et al., 2012; Nguyen, 2012). Third, they look for trading partners who can help them secure new trading partners. This is the Foreign Export Network effect (Chaney, 2014; He, 2018).

We provide three major contributions to the existing literature on this topic. We are the first to assess the joint effects of domestic spillovers and foreign networks, while keeping the sequential exporting effect constant. Previous research studied these effects in isolation. We also use a finer, firm-to-firm measure of networks, which is more accurate and better addresses the problem of unobserved correlates than the previously-used firm-to-country measure of networks. Finally, we explore whether, in addition to previously explored foreign exporting networks, foreign importing networks and domestic importing networks also have an effect on a firm's choice of new export destinations.

Our empirical approach is as follows. Using transaction-level data of Colombian exports from 2007-2016, we first identified 183 Colombian exporting firms that originally exported only to Chile and later expanded to a new destination. Using Chilean firm names recorded in the Colombian Exports and Chilean Imports transaction data from 2007-2016, we attempted to match these 183 Colombian firms to their Chilean importing counterparts. We successfully matched 163 Colombian firms and dropped the remaining 20 unmatched firms. These matches, along with the additional transaction dataset on Chilean Exports, allowed us to construct two network dummy variables. The Chilean Exports Network dummy equals one for any destination to which a matched Chilean firm exports, and equals zero for all other destinations. Similarly, the Chilean Imports Network dummy is equal to one for all destinations from which the matched Chilean firm imports, and zero otherwise. Next, we matched Colombian exports and imports data (using additional Colombian transaction-level Imports data) and constructed the Colombian Imports Network dummy for each of the 163 firms. We set

this variable to one for all destinations from which a firm imports, and to zero otherwise.

Additionally, for each of the matched 163 Colombian firms, we constructed a Spillover dummy, equal to one for all destinations for which a product of the expanding firm was exported by at least one other Colombian firm in the previous year, and zero otherwise. We also complemented the constructed set of dummies with the standard control variables used by Chaney (2014), i.e., geographic proximity measures, import and export growth rates, and market size.

Using the constructed dataset, we employed a dynamic Probit model¹ to explore which factors affect the choice of new export destinations by a Colombian export firm in year $t + 1$, given that in year t it exported only to Chile. This approach allowed us to control for the sequential exporting effect—by construction, it is exactly the same for all firms in our sample—and to jointly estimate Domestic Spillover (DS), Foreign Export Network (FEN), Domestic Import Network, and Foreign Import Network effects at the firm-to-firm level.

We found that, out of these four, only DS and FEN have statistically significant effects on the expansion path. Jointly, DS and FEN have a more important effect than all other factors (including proximity, import and export growth rates, and market size) combined. While DS has a relatively stronger marginal effect, both DS and FEN have economically significant effects, which amplify each other. For example, the probability of choosing the U.S. as the next export destination is only 2.7% if neither of the DS and FEN effects is present, 8% with the FEN effect only, 15.6% with the DS effect only, and 31.5% if both FEN and DS effects are present.²

We also found that omitting the Domestic Spillover dummy from the empirical specification significantly increases the magnitudes of almost all other coefficients in the Probit specification,³ suggesting a pronounced omitted variables bias. Omitting the *all three* Network dummies, on the other hand, has only a marginal effect on all other coefficients. Thus, the omitted variables bias seems to be a strong concern for omitting

¹As we show in the Appendix Table A1, the results are very similar to those obtained with the dynamic Logit model.

²The corresponding numbers are 0.3%, 1.2%, 3.2%, 9.3% for Mexico, 0.3%, 1.4%, 3.6%, 10.2% for Honduras, 0.05%, 0.3%, 0.9%, 3.2% for Ukraine, and 0.1%, 0.4%, 1.2%, 4.2% for Zimbabwe.

³Namely, the FEN coefficient increases by 1.5 times, many other coefficients increase by 2-3 times.

the Spillover dummy, but not for omitting the Network dummies.

Most new Colombian export firms are short-lived: [Eaton et al. \(2007\)](#) showed that two-thirds of them do not survive to the second year. For this reason, we also examined which factors contribute to *persistent* export expansion. To this end, we introduced a new dependent variable, the Survival dummy, which equals one if exports to a new destination continue for more than a year, and zero otherwise.⁴ By using the same set of dependent variables, we found that only the DS has a statistically significant effect on the Survival. That is, for firms with minimal export networks and only one prior export country, domestic spillovers is the single and most important factor in persistent exporting to new destinations. This result re-emphasizes the importance of spillovers generated by export pioneers for other firms ([Hausmann and Rodrik, 2003](#)) and the fact that pioneers face high risks of failure ([Wagner and Zahler, 2015](#)).

We recognize that our results are, at best, representative only for export firms from developing countries that initially export to only one other (developing) country. At the same time, the constraints imposed on our sample by the data availability have certain advantages when examining networks effects. We focused on the exporters with a minimal FEN—typically consisting of just one Chilean firm. As demonstrated both theoretically and empirically by [Chaney \(2014\)](#), these firms are least likely to expand, as their networks are minimal. Thus, showing that the FEN have both statistically and economically significant effects on expansion path even for the smallest possible networks provides even stronger support for network theory in this context.

Furthermore, focusing on firms with a single trade partner allowed to downplay additional, more complex effects present in larger networks, such as reputation effects, homophile⁵, segregation, etc.⁶ For example, a firm with multiple trading partners is potentially likely to have a stronger reputation in the eyes of the potential new partners, as multiple trading partners project higher quality and reliability than a firm with only few partners. Thus, even if a firm meets a new partner without direct involve-

⁴Similarly to previous studies on export spells of Colombian firms, only one third of new export expansions results in the persistent exporting.

⁵The widely known analog of homophily effect in trade is Linder effect—firms are more likely to export to countries with the similar income per capita as the one in their own country.

⁶See, for example, [Currarini et al. \(2009\)](#) and [Jackson and Zenou \(2015\)](#) for a more detailed description of these and other additional effects in larger social networks.

ment of the existing partner, being a part of the larger network might have facilitated the match. Focusing on firms with a minimal network allowed us to isolate these effects.

The rest of the paper is organized as follows. Section 2 discusses related literature. Section 3 provides a detailed data description. Section 4 presents empirical models and the estimation results. Section 5 provides robustness checks. Section 6 concludes.

2 Related Literature

This paper contributes to several strands of literature. Most directly, it adds to a large literature on firms' expansion in international markets. The existing literature has identified three strategies that firms use to expand into new markets: domestic information spillover, foreign networks, and sequential exporting.

The literature on domestic spillovers is likely the largest one among the three. It emphasizes the pool of existing exporters as an important source of information for other firms (Koenig et al., 2010). Firms tend to learn about profits, requirements, and challenges in the overseas markets by observing other firms' exporting experience, and they tend to imitate the export behavior of the more successful, more experienced leaders. Clerides et al. (1998), Silvente and Giménez (2007), Koenig (2009), Koenig et al. (2010), and Choquette and Meinen (2015) used firm-level data from different countries to show that a firm's export decision and/or the volume exported by the firm are positively affected by their neighboring firms.⁷ Aitken et al. (1997), Greenaway et al. (2004), and Kneller and Pisu (2007) identified multinationals as one of the most important sources of information spillover. Iacovone and Javorcik (2010) used Mexican export data to show that once a firm begins exporting a new product, other firms will soon export the same products. Wagner and Zahler (2015) explored detailed data on new exporters in Chile and found that followers are 40% more likely to enter a product if a pioneer survives more than one year of exporting that product.

⁷There is also theoretical and empirical literature on the negative effect of spillovers on firms' export decisions. For example, Ciliberto and Jäkel (2017) documented the negative effects of present competitors on foreign market entry, but they only focus on the superstar exporters. Barrios et al. (2003) and Bernard and Jensen (2004) found no evidence of spillover effects on firms' decisions to export, but they didn't address the expansion to new markets for firms that already export.

Our contribution to this literature is twofold. First, when examining the spillover effects, we controlled for other important effects, including network and sequential-export effects. Second, we were able to rank the magnitude of the spillover effect versus other effects. We found that for the firms with small exporting networks, the spillover effect is much more important. Specifically, it has the highest economic significance for the expansion path, and it is the only statistically significant factor affecting the survival of exports to a new destinations for more than a year.⁸ Importantly, omitting the spillover effect in the empirical specification leads to very pronounced upward biases of other effect.

The literature on networks and trade dates back to [Rauch \(1999\)](#), who introduced the idea that informational frictions dampen trade, and that social networks between buyers and sellers help reducing these frictions and promote trade.⁹ While a more recent strand of the literature empirically estimates the trade-creating effect of networks using country-specific case studies,¹⁰ it is relatively silent on the expansion path at the firm level.

Do exporting firms rely on their networks of existing trade partners to search for new trade partners? This question was first positively answered by [Chaney \(2014\)](#), who provided the reduced-form evidence of the effect of firm-to-country networks on the export expansion path of French firms¹¹ and formally modeled the remote search for new partners through existing trading partners. Building on [Chaney \(2014\)](#)'s work, we provide an additional test of the effect of networks on trade expansion by using a finer firm-to-firm measure of networks of Colombian and Chilean firms. We show that firm-to-firm networks do have a positive effect on the choice of new export destinations even after controlling for the spillover and sequential-exporting effects. Quantitatively, we show that a Colombian firm is 0.42% more likely to choose a new export destination

⁸Other determinants of firm survival in export markets include export sunk and fixed costs, distance, and previous export experience ([Békés and Muraközy, 2012](#); [Impullitti et al., 2013](#); [Albornoz et al., 2016](#); [Araujo et al., 2016](#)). [Cadot et al. \(2013\)](#) found evidence of positive spillover effects (i.e. existence of cross-firm externalities) on export survival.

⁹See also [Rauch \(2001\)](#), [Chaney \(2016\)](#), and [Bernard and Moxnes \(2018\)](#) for excellent surveys on networks and trade.

¹⁰[Rauch and Trindade \(2002\)](#), [Combes et al. \(2005\)](#), [Greaney \(2009\)](#), [Garmendia et al. \(2012\)](#), and [Aleksynska and Peri \(2014\)](#) while using different methodologies and/or datasets, arrive at the same conclusion that the cultural, social, and business networks can largely facilitate international trade.

¹¹Specifically he showed that firms are more likely to choose a new export destination that is closely related to the network they belong to.

if its Chilean trade partners exported to that country in the previous period.

In addition, the firm-to-firm measure allowed us to address the problem of unobserved correlates highlighted by [Muendler and Rauch \(2018\)](#). According to the network literature, firms use the ‘base’ markets (i.e., the markets they have already entered) to search for trading partners in new, geographically close markets. [Muendler and Rauch \(2018\)](#) argued that, alternatively, these markets might be targeted with higher probability not necessarily because of the network search from the base markets, but because they are similar and close to base markets. Empirically, it is difficult to distinguish between the two channels with the firm-to-country measure of networks. The firm-to-firm measure of networks helps to resolve this problem, since network search will be attributed only to those new markets to which only firm’s trading partners export.¹²

Our paper is also related to a new but flourishing literature that focuses on the firm-to-firm connections in international trade. The vast majority of world trade flow is between firms. However, many empirical studies are restricted to aggregated trade, due to the scarcity of the detailed trade transaction data between firms. Recently, with the increasing availability of firm-to-firm trade data, the literature has started to explore the role of the connections between individual exporters and importers. For example, [Rauch and Watson \(2004\)](#), [Antras and Costinot \(2011\)](#), [Petropoulou \(2008\)](#), and [Chaney \(2014\)](#) modeled intermediaries as agents that facilitate matching between exporters and foreign buyers. [Benguria \(2015\)](#) proposed a model to analyze the sorting and matching between exporting and importing firms and provides empirical evidence in support of this theory. Other papers have examined the cross-section and/or evolution of firm-to-firm connections in trade ([Eaton et al., 2009](#); [Blum et al., 2010, 2012](#); [Bernard et al., 2014, 2018](#); [Dragusanu, 2014](#); [Monarch, 2014](#)). We show that these connections are critical for a firm’s choice of new export destinations.

¹²Potentially, the problem of unobserved correlates might be present when identifying the spillover effects. We address it in the robustness checks section.

3 Data Description

Our primary data source is the customs records of Colombian and Chilean import and export transactions between 2007 and 2016.¹³ A transaction record includes the firm’s national tax ID number, the product code at Harmonized System (HS) 10-digit level,¹⁴ the value of the transaction in US dollars, the country of destination for export data, and the country of origin for import data. Importantly, in the Colombian export data, we also observe the names of foreign importing firms, which allows us to identify Chilean firms that import from Colombia.¹⁵

Dependent Variables: Entry and Survival. Using Colombian transaction-level export data, we first identified 183 Colombian exporters that originally exported only to Chile and later expanded to new destinations. Using Chilean firm names recorded in the Colombian Exports and Chilean Imports transaction data, we successfully matched 163 of these Colombian firms to their Chilean importing counterparts from 2007-2016.¹⁶ For these 163 Colombian firms, we define the Entry dummy, $Entry_{i,c,t+1}$, to be equal to one if, conditional on exporting only to Chile in year t and to a new destination in year $t+1$, it exported to country c , and zero if it did not export to country c . If $Entry_{i,c,t+1}$ is equal to one, and firm i exported to country c for longer than one calendar year, we define the Survival dummy, $Survival_{i,c,t+1}$, to be equal to one. $Survival_{i,c,t+1}$ is equal to zero if new exporting was not shipped to country c , or if exporting to c lasted for less than one calendar year.

We considered 183 countries as potential new export destinations for matched Colombian firms, which gave us a total of 29,829 ($= (163 \text{ firms}) \times (183 \text{ countries})$) possible firm-destination combinations. As shown in the first column of Table 1, we found that Entry dummy equals one for 237 of these combinations, whereas Survival dummy

¹³The data is obtained from Datamyne, a company that specializes in documenting import and export transactions in Americas. For more detail please see www.datamyne.com.

¹⁴In our paper we need the product dimension only for the Colombian part of the data, which is at HS10.

¹⁵The names of these Chilean firms are not standardized in the Colombian exports data. There are instances in which the name of the same firm and its address are recorded differently (e.g., using abbreviations, dots, dashes, extra spaces, etc.). We deal with this problem by standardizing the spelling of the names and by comparing these names to the standardized names of firms in the Chilean imports data. The detailed description of cleaning the exporters’ names is provided in the Appendix A.

¹⁶We drop the unmatched 20 Colombian exporting firms from our analysis.

equals one for only 62 of them. That is, conditional on expanding, a firm that previously exported only to Chile will export, on average, to $237/163=1.5$ new destinations, but only 26% ($=(62/237)\times 100\%$) of these expansions will survive for more than one calendar year.

Export and Import Network Dummies. The matches between Colombian exporting and Chilean importing firms, along with the additional transaction dataset on Chilean Exports, allowed us to construct two network dummy variables. The Chilean Export Network dummy, $ExpNetwork_{i,c,t}$, equals one for all firm c 's destinations to which any of its matched Chilean importing firms exports, and zero otherwise. We observed that only 73 of these matched Chilean firms exported (on average to 4.9 destinations). As shown in Column 4 of Table 1, this gives us 370 ones and $29,829-370=29,459$ zeros for the Export Network dummy variable.

Similarly, the Chilean Import Network dummy, $CHL_ImpNetwork_{i,c,t}$, is equal to one for all destinations from which the matched Chilean firm imports and zero otherwise. As shown in Column 5 of Table 1, we observe 998 ones and 28,831 zeros for $CHL_ImpNetwork_{i,c,t}$.

In addition, we matched Colombian exports and imports data and constructed the Colombian Import Network dummy variable, $COL_ImpNetwork_{i,c,t}$, for each of the 163 Colombian firms by setting it to one for each country c from which firm i imports and to zero otherwise. We observed 571 ones and 29,258 zeros for the Colombian Import Network dummy variable (see Column 6 of Table 1).

Domestic Spillover Dummy. For each of the matched 163 Colombian firms, we constructed a Spillover dummy variable $Spillover_{i,c,t}$. For each expanding firm, we first identified which HS 10-digit product was exported to the new export destination. We then explored the Colombian transaction-level export data to see if there was any other Colombian firm exporting the same product to the same destination in the previous year. If yes, the Spillover dummy for that firm-destination pair, $Spillover_{i,c,t}$, was set to one. If not, it was set to zero. As shown in Column 3 of Table 1, we observe 4,649 ones and 25,180 zeros for the Spillover dummy variable.

Other Variables. Following Chaney (2014), we also used six additional variables to control for geographic proximity, import sources, market size, and export and import growth.

(i) $CHL_ExpGrowth_{i,c,t}$ measures the export growth to country c between years t and $t + 1$ of Chilean firms importing from the Colombian firm i :

$$CHL_ExpGrowth_{i,c,t} \equiv \sum_{j \in K} \frac{Export_{j,c,t+1} - Export_{j,c,t}}{Export_{j,c,t}},$$

where K is the set of Chilean firms importing from the Colombian firm i .

(ii) $Overall_ImpGrowth_{c,t}$ measures country c 's import growth from all other countries between years t and $t + 1$:

$$Overall_ImpGrowth_{c,t} \equiv \sum_{c'} \frac{Import_{c,c',t+1} - Import_{c,c',t}}{Import_{c,c',t}}$$

The bilateral trade data was obtained from the United Nations Comtrade Database.

(iii)-(v) Using the bilateral distance data, we computed the proximities between Colombia and other countries:

$$COL_proximity_c \equiv \frac{1}{Dist_{COL,c}};$$

between Chile and other countries:

$$CHL_proximity_c \equiv \frac{1}{Dist_{CHL,c}};$$

and the average proximity of each country from the rest of the world:

$$Overall_proximity_c \equiv \frac{1}{N} \sum_{c'} \frac{1}{Dist_{c',c}},$$

where $N = 183$ is the total number of countries in our sample. The data on bilateral distances ($Dist_{COL,c}$, $Dist_{CHL,c}$, $Dist_{c',c}$) is obtained from CEPII. It is calculated as the population-weighted average of the distances between the main cities of two countries.

(vi) The country size of country c in year t , $GDP_{c,t}$, is measured by its nominal GDP (in billions of US dollars), obtained from the Penn World Tables.

Table 1 presents the summary statistics for each variable we use in the empirical specifications and Table 2 lists the correlation coefficients between these variables. Table 2 shows that the correlations between any two independent variables are rather low: the highest correlation coefficients are around 0.3-0.44, and most of them are less than 0.1. The correlations between the dependent and independent variables are also rather low: the highest ones for both Entry and Survival are with the Spillover dummy: 0.18 and 0.11 respectively.

Graphically, Figure 1 shows the geographic maps for the new destinations that the Colombian firms expand to, as well as the export destinations of their peer firms and their matched Chilean trade partners. The intensity of the color represents the frequencies of exports. We can see that there is an overlap between the Colombian firms' new export destinations and the export destinations of their peer firms and Chilean trade partners, suggesting that exporting firms may rely on both domestic spillovers and foreign networks when choosing a new export destination.

4 Empirical Model and Estimation Results

In this section, we present the empirical model and explore to what extent firms rely on domestic spillovers and foreign networks when choosing a new export destination. Specifically, we use a dynamic Probit model to examine whether, conditional on expanding its exports to a new destination, a Colombian firm i is more likely to choose country c rather than any other country due to network and domestic spillover effects.

Table 1: Summary Statistics

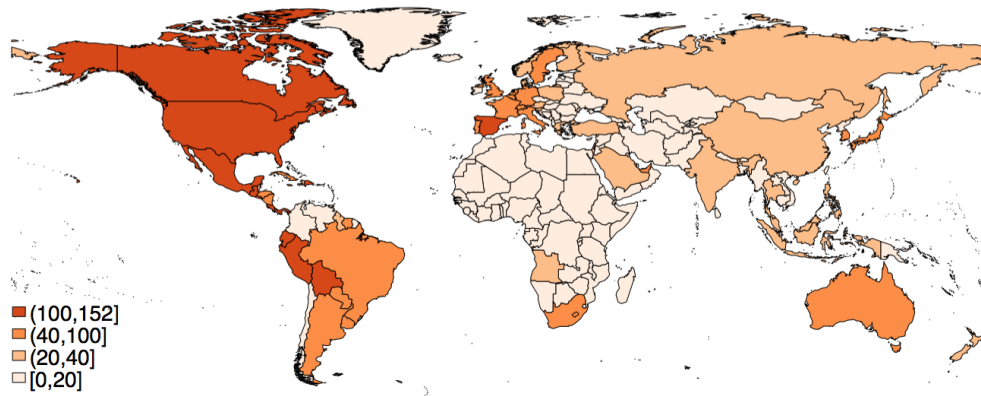
	Entry	Survival	Spillover	ExpNetwork	CHL ImpNetwork	COL ImpNetwork	COL proximity	CHL proximity	Overall proximity	CHL ExpGrowth	Overall ImpGrowth	GDP
No. of Obs.	29,829	23,790	29,829	29,829	29,829	29,829	29,829 ^a	29,829 ^b	29,829 ^c	29,829	29,829 ^d	29,829 ^e
Mean	0.0079	0.0026	0.1559	0.0124	0.0335	0.0191	0.1744	0.1133	0.3162	0.0293	38378.85	3.38×10^7
Median	0	0	0	0	0	0	0.099	0.0841	0.2678	0	269.6993	25.9426
Std.Dev.	0.0888	0.051	0.3627	0.1107	0.1798	0.137	0.2064	0.098	0.2625	2.6281	893535.8	1.42×10^8
Min	0	0	0	0	0	0	0.0516	0.053	0.097	-2.2793	-102	0.1305
Max	1	1	1	1	1	1	1.3633	0.8645	3.2835	369.4083	3.38×10^7	1.81×10^9
No. of ones	237	62	4,649	370	998	571						
Percent of ones	0.79%	0.26%	15.59%	1.24%	3.35%	1.91%						

^{a,b,c} Data on proximity are country-specific. We have 183 countries in our sample, and each of them is repeated 163 times for all Colombian firms.

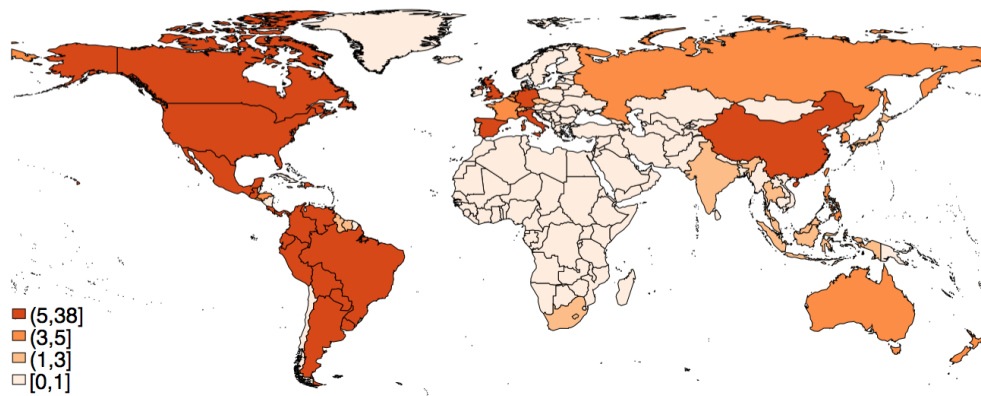
^{d,e} Data on *Overall_ImpGrowth* and GDP are country-year-specific. We have 183 (countries) \times 9 (years) = 1,647 country-year combinations. Each combination is repeated for the expanding Colombian firms in the corresponding year.

Table 2: Correlation Coefficients Between Variables

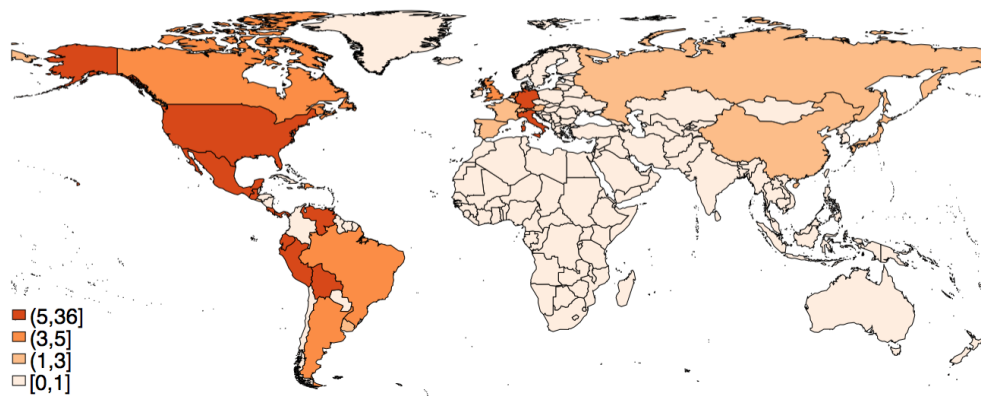
	Entry	Survival	Spillover	ExpNetwork	CHL ImpNetwork	COL ImpNetwork	COL proximity	CHL proximity	Overall proximity	CHL ExpGrowth	Overall ImpGrowth	GDP
Entry	1											
Survival	0.57	1										
Spillover	0.18	0.11	1									
ExpNetwork	0.12	0.03	0.09	1								
CHL_ImpNetwork	0.07	0.04	0.12	0.25	1							
COL_ImpNetwork	0.05	0.03	0.1	0.11	0.31	1						
COL_proximity	0.15	0.08	0.39	0.11	0.00	-0.00	1					
CHL_proximity	0.1	0.05	0.27	0.2	0.1	0.01	0.44	1				
Overall_proximity	-0.04	-0.02	-0.07	-0.05	-0.05	-0.04	-0.03	-0.11	1			
CHL_ExpGrowth	0.06	0.00	0.01	0.11	0.03	0.05	-0.00	0.00	-0.00	1		
Overall_ImpGrowth	-0.00	-0.00	-0.00	-0.00	-0.01	-0.00	-0.01	-0.01	0.01	-0.00	1	
GDP	0.14	0.1	0.23	0.1	0.32	0.3	-0.04	-0.03	-0.09	0.04	-0.00	1



(a) Export destinations of Colombian peer firms



(b) Export destinations of matched Chilean importing firms



(c) New destinations that Colombian firms expand to

Figure 1: Export Maps of Colombian and Chilean Firms

Empirical Model. Building on and expanding the empirical model of Chaney (2014), we employ the following specification:

$$\begin{aligned}
(1) \quad & Prob(Entry_{i,c,t+1} > 0 \mid observables) \\
& = \Phi \left(\alpha Spillover_{i,c,t} \right. \\
& \quad + \beta_1 ExpNetwork_{i,c,t} + \beta_2 CHL_ImpNetwork_{i,c,t} + \beta_3 COL_ImpNetwork_{i,c,t} \\
& \quad + \gamma_1 COL_proximity_c + \gamma_2 CHL_proximity_c + \gamma_3 Overall_proximity_c \\
& \quad + \lambda_1 CHL_ExpGrowth_{i,c,t} + \lambda_2 Overall_ImpGrowth_{c,t} \\
& \quad \left. + \delta GDP_{c,t} \right),
\end{aligned}$$

where

$\mathbf{1}[Entry_{i,c,t+1} > 0]$ is the dependent variable set to 1 if, conditional on entering a new (other than Chile) country in year $t + 1$, firm i enters country c and 0 if not;

α captures the domestic spillover effect among the Colombian firms within the same HS 10-digit product ($\alpha > 0$ would indicate that a firm is more likely to choose country c for its expansion if its peers exported the same product to c in the previous year);

β_1 , β_2 , and β_3 capture the Foreign Export Network, Foreign Import Network, and Domestic Import Network effects, respectively (e.g., $\beta_1 > 0$ would suggest that firm i has a higher chance to expand to c if its Chilean trading partner exported to c in the previous year);¹⁷

γ_1 , γ_2 , and γ_3 capture the effects of proximity to Colombia, proximity to Chile, and overall proximity of country c , respectively (e.g., γ_1 would indicate that the probability of choosing c as the new market increases in its proximity to Colombia);

λ_1 captures the effect of the export growth (between years t and $t+1$) of Chilean firms which import from the Colombian firm i ;

λ_2 captures the effect of the average import growth by country c from all other countries between years t and $t + 1$;

δ accounts for the effect of economic size since firms are mechanically more likely to export to large countries with greater market size.

To examine which of the above-mentioned factors contribute to persistent export ex-

¹⁷Similarly, β_2 measures the effects of Chilean import network and β_3 investigates whether a firm is more likely to export to a country from which it imports.

pansion, we also estimate the effect of the same independent variables on the Survival dummy, which equals one if the exports to a new destination persist for more than a year, and zero otherwise:

$$\begin{aligned}
(2) \quad & Prob(Survival_{i,c,t+1} > 0 \mid observables) \\
& = \Phi \left(\alpha' Spillover_{i,c,t} \right. \\
& \quad + \beta'_1 ExpNetwork_{i,c,t} + \beta'_2 CHL_ImpNetwork_{i,c,t} + \beta'_3 COL_ImpNetwork_{i,c,t} \\
& \quad + \gamma'_1 COL_proximity_c + \gamma'_2 CHL_proximity_c + \gamma'_3 Overall_proximity_c \\
& \quad + \lambda'_1 CHL_ExpGrowth_{i,c,t} + \lambda'_2 Overall_ImpGrowth_{c,t} \\
& \quad \left. + \delta' GDP_{c,t} \right),
\end{aligned}$$

Main Conjectures. Our main focus is on the Spillover and Networks coefficients: α , β_1 , β_2 , and β_3 . Specifically, we expect the spillover and export network effects to be significantly positive. If there are other Colombian firms exporting the same product to a particular country, this implies that consumer preferences, competition intensity, and other market characteristics of that country are potentially desirable for the Colombian exporters of that product.¹⁸ Therefore, the Colombian firm would be more likely to export to that country as it has a higher chance to succeed there, i.e., $\alpha > 0$. In addition, according to the remote search idea in Chaney (2014), a Colombian firm that has acquired a trade partner in Chile would search for new trade partners, just like Chilean firms would. Thus, we would expect the Colombian firm to choose a new export destination, just as its Chilean trade partners, i.e., $\beta_1 > 0$.

Note that export networks described above are likely to contain detailed information about products exported by Colombian firms potentially embedded in the exports of Chilean firms which may have used the original Colombian product as an intermediate. This type of information is not present through either Colombian or Chilean import networks. Thus, we expect the import network effects to be either smaller or statistically insignificant.

All proximity variables were also used in Chaney (2014)'s original specification. Chaney (2014) expected for coefficients γ_1 and γ_2 to be positive and statistically significant,

¹⁸See, for example, Greenaway et al. (2004), Silvente and Giménez (2007), Koenig et al. (2010).

as firms are expected to be more likely to enter the markets closer to the exporting country and to the firm's previous export destinations. Coefficient γ_3 , on the other hand, was expected to be negative, as we would expect the level of competition to be higher in countries that are closer to other countries, making it more difficult to break into those markets.

At the same time, both Colombian and Chilean proximity variables are positively correlated with both Spillover and Export Network dummies, which were not present in [Chaney \(2014\)](#)'s specification. Similarly, the Overall proximity is negatively correlated with these dummies. As a result, the presence of the Spillover and Export Network dummies is likely to decrease the magnitudes of the geographic proximity effects on the choice of the new export destination.

Finally, the effect of the export growth of Chilean firms that import from Colombian firm i is expected to have a positive effect on the choice of new export destination. As motivated by [Chaney \(2014\)](#), the trade flows between the Chilean trade partners and country c can be used as a proxy for the intensity of their communication. If there is an export growth from these Chilean trade partners to country c , it implies that the communication between them increases and the exposure of the exporting firm i rises and as a result, we would expect the firm to be more likely to enter this new market. Note that we measure only the export growth of the direct Chilean importers from a Colombian firm to the third country, whereas [Chaney \(2014\)](#) measured the export growth of the entire country importing from a French firm to the third country. Thus, we expect our measure to be more directly linked to the network theory. Again, as with the geographic proximity effects, the presence of the Spillover and Export Network dummies is likely to dampen the export growth effects.

Results. Table 3 summarizes the estimation results of equations (1) and (2). We present the estimated marginal effects rather than the coefficients, to aid interpretation. Columns (1)-(3) present the results for the expansion to new export destinations and Columns (4)-(6) present the results for the survival of these export expansions.

The results suggest that only the Spillover and Export Network have statistically significantly positive effects on a firm's choice of new export destinations while neither

Table 3: Estimated Marginal Effects of Domestic Spillover and Foreign Network

Dependent Variable	Probability of Entry			Probability of Survival		
	(1)	(2)	(3)	(4)	(5)	(6)
Spillover	0.012*** (0.0036)		0.0114*** (0.0035)	0.0058** (0.0028)		0.0057** (0.0028)
ExpNetwork		0.0077** (0.0032)	0.0049** (0.0018)		0.0001 (0.0008)	0.00005 (0.0002)
CHL_ImpNetwork		0.0013 (0.0015)	0.0005 (0.0007)		0.0007 (0.0011)	0.0001 (0.0003)
COL_ImpNetwork		0.0034 (0.0025)	0.0014 (0.0011)		0.00005 (0.0007)	-0.00002 (0.0001)
COL_proximity	0.0039*** (0.0007)	0.0105*** (0.0019)	0.0037*** (0.0007)	0.0004 (0.0003)	0.0034*** (0.0012)	0.0004 (0.0003)
CHL_proximity	0.0033*** (0.0011)	0.0074*** (0.0017)	0.0026** (0.001)	0.0003 (0.0003)	0.0026** (0.0011)	0.0002 (0.0003)
overall_proximity	-0.0059*** (0.0012)	-0.01*** (0.0018)	-0.0052*** (0.0012)	-0.0008** (0.0004)	-0.0037*** (0.0011)	-0.0008** (0.0004)
CHL_ExpGrowth	0.00004** (0.00002)	0.00004* (0.00003)	0.00003* (0.00002)	-1.06×10^{-6} (0.0000)	-5.87×10^{-6} (0.00001)	-1.66×10^{-6} (0.0000)
overall_ImpGrowth	-7.35×10^{-11} (0.0000)	-1.31×10^{-10} (0.0000)	-8.1×10^{-11} (0.0000)	-1.69×10^{-10} (0.0000)	-4.75×10^{-10} (0.0000)	-1.65×10^{-10} (0.0000)
GDP	3.23×10^{-12} *** (0.0000)	7.06×10^{-12} *** (0.0000)	2.72×10^{-12} *** (0.0000)	3.84×10^{-13} (0.0000)	2.6×10^{-12} ** (0.0000)	3.52×10^{-13} (0.0000)
Years	2007-2015	2007-2015	2007-2015	2007-2014	2007-2014	2007-2014
No. of obs.	29,829 ^a	29,829	29,829	23,790	23,790	23,790
R-square	0.3182	0.2682	0.3296	0.2963	0.2045	0.2975

Notes: This table shows the marginal effects for the Probit estimation of equation (1) and (2) for 163 Colombian expanding exporters between 2007 and 2016. Columns (1)-(3) present the results for expansion to new export destinations and Columns (4)-(6) present results for the survival of these export expansions. The marginal effect is calculated as dy/dx at the average value of each x in the sample. dy/dx stands for a discrete change from 0 to 1 when x is a dummy variable. Standard errors are clustered at the firm level. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

^a The GDP data for Venezuela in 2015 is not available, so we assign the same GDP to Venezuela in 2015 as it had in 2014. The results are robust if we exclude Venezuela from the sample.

of the Import Networks does. On average, a Colombian firm is 1.08% more likely to export to a new country if at least one other Colombian firm exported the same HS 10-digit product to that country in the previous period (Spillover), and 0.42% more likely to choose a new export destination if its Chilean importer exported to that country in the previous period (Foreign Network).

Our data allow us to provide more direct evidence on the importance of export networks for targeting new destinations than the previous literature. Chaney (2014) used French firm-to-country trade to examine the network effects. He defined a firm's network of trade partners as the existing portfolio of its export destinations, and showed that the existing export destinations shape a firm's future expansions into new markets.

Recent empirical and theoretical literature on matching and networks in trade, however, emphasizes the firm-to-consumer and firm-to-firm matching. That is, exporting firms connect with only a subset of all consumers and firms in a given location.¹⁹ In line with this literature, exploring firm-to-firm networks which allows us to provide more direct evidence for network effects. Specifically, we show that a Colombian firm is more likely to choose a new export destination if its Chilean importing counterpart has previously been exporting there.

In line with our conjectures, both Colombian and Chilean Import Network effects are statistically insignificant. Thus, being connected with other countries without information embedded in exported products (as in Export Networks) is unlikely to have an effect on a firm's choice of its next export destination.

Column 3 of Table 3 indicates that, in the Entry regression, all proximity coefficients have the expected signs. Furthermore, the comparison of Columns 1 and 2 to Column 3 shows that omitting the Spillover dummy in the empirical specification produces a very pronounced upward bias in the magnitudes of the coefficients, while omitting the Network dummies has only a marginal effect on the magnitudes of the coefficients. According to Column 6 of Table 3, in the presence of the Spillover dummy, none of the proximity variables affects the probability of survival for more than one year of exporting to a new destination.

Similarly, the export and import growth coefficients are of the expected sign in the Entry regression, and their magnitudes increase substantially in the specification with the omitted Spillover dummy. Neither import nor export growth effects are statistically significant in the Survival regression (Column 6).

Overall, by comparing the estimated results in Columns (1) and (2) to Column (3), we found that estimating the Spillover and Foreign Network effects separately would result in an overestimation of all other effects in our model, which suggests a pronounced omitted variable bias. It is thus more appropriate and accurate to jointly estimate

¹⁹In the context of international trade these ideas have been emphasized and formalized in the recent work of [Arkolakis \(2010\)](#) and [Chaney \(2014\)](#) among others. They also provide detailed reviews of the relevant network and matching literatures.

these effects together.

Economic Significance. Our results show that the spillover and export network effects are jointly more important than the proximity, export and import growth, and market size factors combined. To illustrate this point, we compute the fitted probability of choosing a particular country as the new export destination under four scenarios: (i) All other effects for a given country except for Export Network and Spillover effects; (ii) All other effects for a given country plus Export Network (but not Spillover) effect; (iii) All other effects for a given country plus Spillover (but not Export Network) effect; (iv) All other effects for a given country plus Spillover and Export Network effects.

The results are present in Figure 2. The graphs demonstrate several important findings. First, Colombian firms have much higher chances to expand to North American and Latin American countries compared to European, Asian, and other countries. Second, the probability of expanding to a new export destination increases significantly when either the spillover or the network effects are present. Third, the domestic spillover effect is stronger than the export network effect. Finally, when both effects are present, the probability reaches its peak. For example, the probability of choosing the U.S. as the next export destination is only 2.7% if none of the effects is present, 8% with the export network effect only, 15.6% with the spillover effect only, and 31.5% if both export network and spillover effects are present.

Similarly, we compute the fitted probability of surviving more than one year for the exports to new destinations and present the results in Figure 3. The new exports to North American and Latin American countries are much more likely to persist for more than one year, as compared to European, Asian, and other countries. Importantly, Spillover effects is the only statistically significant one, and its economic effect is much more pronounced than any other effect, including the Foreign Export Network effect. Specifically, the export to a new destination is 0.57% more likely to persist for more than a year if there was another Colombian firm exporting the same product to that destination in the previous year. This result demonstrates the difficulty in the persistent exporting to new destinations and re-emphasizes the importance of pioneers for successful self-discovery (Hausmann and Rodrik, 2003).

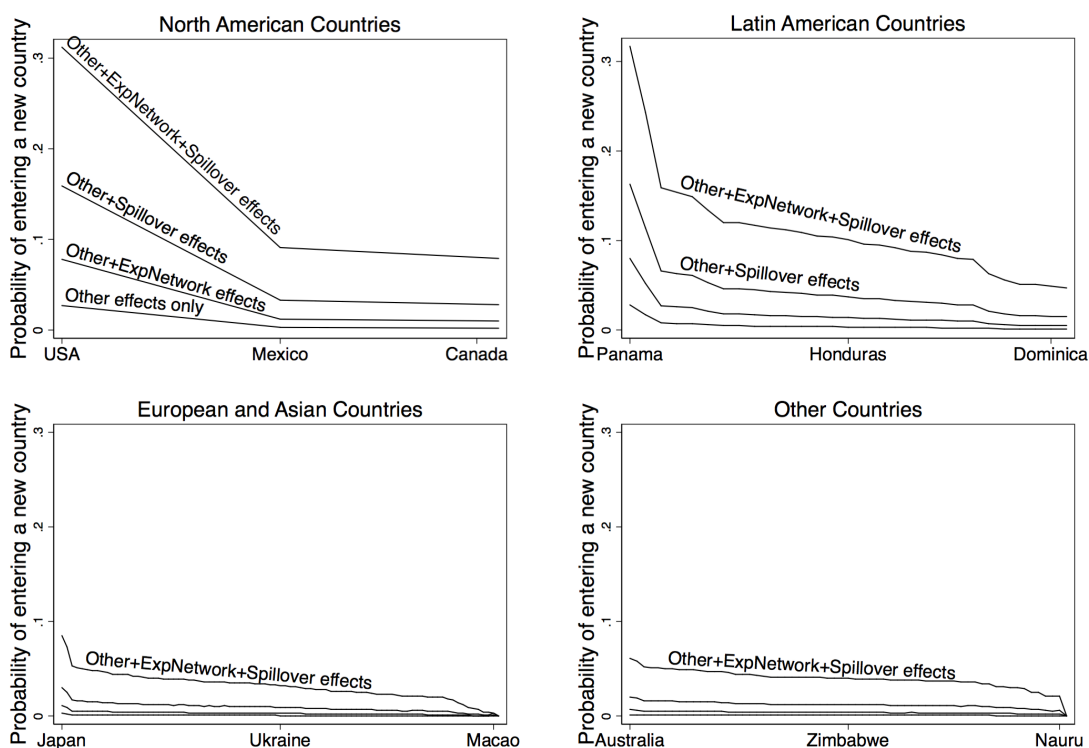


Figure 2: Probability of Choosing a New Export Destination (in 2007)

Note: The order of the lines in the above graphs are the same. From the top to the bottom: with network, spillover, and other effects, with spillover and other effects, with network and other effects, and with other effects only.

As in the Entry regression, new exports are most likely to persist when both domestic spillover and export network effects are present. For example, for new exports to the U.S., the probability of surviving more than one year is only 0.3% if none of the effects is present, 0.4% with the export network effect only, 7% with the spillover effect only, and 7.9% if both export network and spillover effects are present.

Importantly, while not statistically significant, the signs of our other coefficients tend to be in line with the previous research. For example, Colombian firms tend to choose a new export destination that is closely connected to their previous export destinations, either in the sense that it is geographically close, or that it trades a lot with the previous trade partners. These findings are consistent with that of [Lawless \(2013\)](#), [Morales et al. \(2014\)](#), [Chaney \(2014\)](#), and [Defever et al. \(2015\)](#), confirming the important role that previous export destinations play in determining a firm's expansion path.

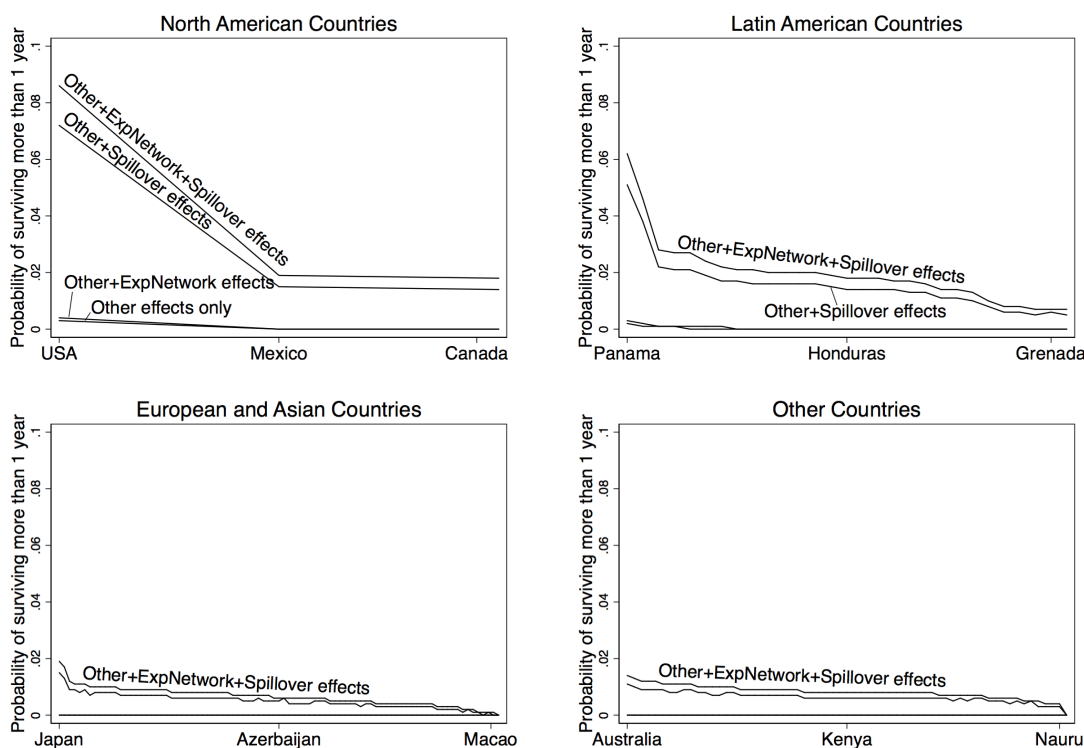


Figure 3: Probability of Surviving More Than One Year (in 2007)

Note: The order of the lines in the above graphs are the same. Form the top to the bottom: with network, spillover, and other effects, with spillover and other effects, with network and other effects, and with other effects only.

5 Robustness Check

Our paper provides empirical evidence for the spillover and network effects on a firm's choice of new export destinations. However, [Muendler and Rauch \(2018\)](#) point out that this literature on export spillover and network search typically have the problem of correlated unobservables. That is, an exporting firm entering a new market might not necessarily because it learned about that market through information spillover or network search, but because that market is similar to the firms' previous export destinations or its home country. We address this concern by using firm-to-firm measure of networks and adding an additional control for adjacency to our empirical specifications.

According to the network literature, firms use the 'base' markets (i.e., the markets they have already entered) to search for trading partners in new, geographically close markets. [Muendler and Rauch \(2018\)](#) argue that, alternatively, these markets might be

targeted with higher probability not necessarily because of the ‘network’ search from the base markets, but because they are similar and close to base markets. Empirically, it is difficult to distinguish between the two channels when using the firm-to-country measure of networks. The firm-to-firm measure of networks helps to resolve this problem, since network search will be attributed only to those new markets to which only a trading partner rather than the whole base market exports.

The problem still potentially exists for the spillover effect. Firms entering the same markets as other firms in the same industry might not be caused by the information spillover, but rather caused by those markets’ similarities or adjacency to the home country. To address this concern, we modified our empirical specifications by adding an adjacency dummy variable which controls for the similarity between the new export destination and Colombia. Following [Morales et al. \(2014\)](#) and [Muendler and Rauch \(2018\)](#), adjacency is defined in four different ways: shared border, shared official language, shared income group (by the World Bank’s classification for calendar year 2007), and shared continent. The results are presented in [Table 4](#). The results are robust both in terms of significance and the magnitudes, suggesting that firms rely on both domestic spillover and foreign networks when choosing a new export destination, even after controlling for the similarities between the new export destination and Colombia.

6 Conclusion

This paper explores the effects of domestic spillovers and foreign networks on an exporting firm’s expansion into new foreign markets. By matching Colombian exporting firms and Chilean importing and exporting firms between 2007 and 2016, we show that both effects have statistically and economically significant positive effects on a firm’s choice of new export destinations. Moreover, domestic spillover effects are relatively more important, particularly for the survival or persistence of a new exporting relationship.

While there is a large literature focusing on how spillover and network effects impact a firm’s expansion to new foreign markets, our paper is the first to jointly estimate these two effects. Thus, we provide a more complete and accurate estimation of these two effects without severe omitted variable bias. More importantly, the joint estimation

Table 4: Estimated Marginal Effects of Domestic Spillover and Foreign Network

Dependent Variable	Probability of Entry				Probability of Survival			
	Contiguous (1)	Language (2)	Income (3)	Continent (4)	Contiguous (5)	Language (6)	Income (7)	Continent (8)
Adjacent	0.0054** (0.0023)	0.0036*** (0.0012)	0.0004 (0.0003)	-0.0006 (0.0005)	0.0006 (0.0005)	0.0008 (0.0005)	0.0001 (0.0001)	-0.0001 (0.0001)
Spillover	0.0123*** (0.0035)	0.0093*** (0.0032)	0.0115*** (0.0035)	0.0121*** (0.0038)	0.0061** (0.0028)	0.0045* (0.0025)	0.0057** (0.0028)	0.0061** (0.0029)
ExpNetwork	0.0048*** (0.0018)	0.0044*** (0.0017)	0.0047*** (0.0018)	0.0055*** (0.0019)	0.0002 (0.0002)	0.0003 (0.0002)	0.0004 (0.0002)	0.0005 (0.0002)
CHL_ImpNetwork	0.0003 (0.0007)	0.0004 (0.0007)	0.0006 (0.0008)	0.0005 (0.0007)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0003)	0.0001 (0.0003)
COL_ImpNetwork	0.0012 (0.0011)	0.0013 (0.0011)	0.0013 (0.0011)	0.0014 (0.0011)	-0.0002 (0.0001)	-0.0003 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)
COL_proximity	0.0024*** (0.0006)	0.0024*** (0.0005)	0.0037*** (0.0007)	0.0043*** (0.001)	0.0002 (0.0002)	0.0002 (0.0002)	0.0004 (0.0003)	0.0005 (0.0003)
CHL_proximity	0.003** (0.0012)	0.0006 (0.0009)	0.0025** (0.001)	0.0035** (0.0015)	0.0002 (0.0003)	-0.0001 (0.0002)	0.0002 (0.0002)	0.0004 (0.0004)
overall_proximity	-0.003** (0.0015)	-0.0034*** (0.0012)	-0.0048*** (0.0012)	-0.0054*** (0.0011)	-0.0005* (0.0003)	-0.0005* (0.0003)	-0.0007** (0.0003)	-0.0008** (0.0004)
CHL_ExpGrowth	0.00003* (0.00002)	0.00002* (0.00001)	0.00003* (0.00002)	0.00003* (0.00002)	-1.62 × 10 ⁻⁶ (0.0000)	-1.5 × 10 ⁻⁶ (0.0000)	-1.63 × 10 ⁻⁶ (0.0000)	-1.57 × 10 ⁻⁶ (0.0000)
overall_ImpGrowth	-1.28 × 10 ⁻¹⁰ (0.0000)	-7.84 × 10 ⁻¹¹ (0.0000)	-8.6 × 10 ⁻¹¹ (0.0000)	-9.49 × 10 ⁻¹¹ (0.0000)	-2.94 × 10 ⁻¹⁰ (0.0000)	-1.39 × 10 ⁻¹⁰ (0.0000)	-2.21 × 10 ⁻¹⁰ (0.0000)	-2 × 10 ⁻¹⁰ (0.0000)
GDP	3.46 × 10 ⁻¹² *** (0.0000)	3.18 × 10 ⁻¹² *** (0.0000)	2.81 × 10 ⁻¹² *** (0.0000)	3.01 × 10 ⁻¹² *** (0.0000)	4.2 × 10 ⁻¹³ *** (0.0000)	4.46 × 10 ⁻¹³ *** (0.0000)	3.59 × 10 ⁻¹³ *** (0.0000)	3.92 × 10 ⁻¹³ *** (0.0000)
Years	2007-2015	2007-2015	2007-2015	2007-2015	2007-2014	2007-2014	2007-2014	2007-2014
No. of obs.	29,829 ^a	29,829	29,829	29,829	23,790	23,790	23,790	23,790
R-square	0.3382	0.3373	0.3302	0.3303	0.3029	0.3076	0.298	0.2986

Notes: This table shows the marginal effects for the Probit estimation of equation (1) and (2), after controlling for the adjacency between the new export destination and Colombia. Columns (1)-(4) present the results for expansion to new export destinations and Columns (5)-(8) present results for the survival of these export expansions. Following [Morales et al. \(2014\)](#) and [Muendler and Rauch \(2018\)](#), adjacency is defined differently in each column: shared border, shared official language, shared income group (by the World Bank's classification for calendar year 2007), and shared continent. The marginal effect is calculated as dy/dx at the average value of each x in the sample. dy/dx stands for a discrete change from 0 to 1 when x is a dummy variable. Standard errors are clustered at the firm level. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.

^a The GDP data for Venezuela in 2015 is not available, so we assign the same GDP to Venezuela in 2015 as it had in 2014. The results are robust if we exclude Venezuela from the sample.

allows us to identify the spillover effect, among all other effects, as the most important factor influencing a firm's choice of new export destinations. Additionally, we construct a new matched exporter-importer dataset to examine the network effects. The finer, firm-to-firm measures of networks is more accurate and informative than the previously used firm-to-country measures of networks.

Although this paper provides empirical evidence for the spillover and network effects in a firm's expansion to new foreign markets, it is still imperative to formulate a theoretical model that substantiates these effects. Moreover, this paper only analyzes the network and spillover effects on the extensive margin of trade (i.e., the expansion to new markets) but remains silent on their effects on the intensive margins (i.e. how much the firm sells to each market). A model for network and spillover effects on the intensive margin of trade would thus also be interesting. Finally, with the increasing availability of firm-level trade data, it is possible to check whether the results of this paper can be generalized to trade between other countries. These questions are left for future research.

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Appendix

A Technical notes on firm-to-firm matching

Matching Colombian exporting firms to their Chilean trade partners plays a critical role in estimating foreign network effects in our paper. We managed to do this, as the Colombian firm-level export data record the name and address of the foreign importing firm for each transaction. However, the foreign firm name data are very noisy. There are instances in which the same firm is recorded differently by using various abbreviations, extra spaces, dashes, dots, and other special signs. To clean and match the importing firm names, we used the following procedure:

1. We dropped all observations with the missing importing firm names.
2. We eliminated the typical prefixes, suffixes, and abbreviations (e.g., “LTDA”, “LLC”, “CO.”, “INC”).
3. We eliminated the non alpha numeric characters (e.g., . / ; () @ &).
4. We compared the importing firm names with the standardized firm names recorded in the Chilean imports data. If the firm names were the same, we accomplished a match.
5. There are cases where the firm names have slightly different spellings than the standardized firm names. In these cases, we performed a further match by address. Specifically, we searched the address of the standardized firm through Internet, and compared it with the address recorded in Colombian export data. If the addresses were the same, we matched the two firms. Otherwise we failed to match.

B Alternative Specification: Logit model

Table A1: Estimated Marginal Effects of Domestic Spillover and Foreign Network

Dependent Variable	Probability of Entry			Probability of Survival		
	(1)	(2)	(3)	(4)	(5)	(6)
Spillover	0.0113*** (0.0037)		0.011*** (0.0035)	0.0057** (0.0028)		0.0057** (0.0028)
ExpNetwork		0.0046** (0.0019)	0.0029*** (0.001)		0.00002 (0.0005)	0.00002 (0.0001)
CHL_ImpNetwork		0.0006 (0.0009)	0.0003 (0.0005)		0.0004 (0.0007)	0.00005 (0.0001)
COL_ImpNetwork		0.0018 (0.0014)	0.0007 (0.0006)		0.00001 (0.0005)	-8.26×10^{-7} (0.0001)
COL_proximity	0.0029*** (0.0006)	0.0085*** (0.0016)	0.0029*** (0.0006)	0.0003 (0.0002)	0.0028*** (0.001)	0.0003 (0.0002)
CHL_proximity	0.0024** (0.0008)	0.0066*** (0.0015)	0.002** (0.0008)	0.0002 (0.0002)	0.0023** (0.001)	0.0001 (0.0002)
overall_proximity	-0.0058*** (0.0012)	-0.0109*** (0.0018)	-0.0052*** (0.0013)	-0.0007* (0.0003)	-0.0039*** (0.0011)	-0.0007* (0.0003)
CHL_ExpGrowth	0.00003** (0.00001)	0.00003 (0.00002)	0.00002* (0.00001)	-6.25×10^{-7} (0.0000)	-3.51×10^{-6} (0.0000)	-8.44×10^{-7} (0.0000)
overall_ImpGrowth	-6.22×10^{-11} (0.0000)	-1.03×10^{-10} (0.0000)	-6.41×10^{-11} (0.0000)	-7.94×10^{-11} (0.0000)	-2.76×10^{-10} (0.0000)	-7.86×10^{-11} (0.0000)
GDP	2.12×10^{-12} *** (0.0000)	5.2×10^{-12} *** (0.0000)	1.89×10^{-12} *** (0.0000)	2.1×10^{-13} (0.0000)	1.95×10^{-12} ** (0.0000)	1.98×10^{-13} (0.0000)
Years	2007-2015	2007-2015	2007-2015	2007-2014	2007-2014	2007-2014
No. of obs.	29,829	29,829	29,829	23,790	23,790	23,790
R-square	0.3134	0.2619	0.3242	0.2979	0.2013	0.2985

Notes: This table shows the marginal effects for the Logit estimation of equation (1) and (2) for 163 Colombian expanding exporters between 2007 and 2016. Column (1)-(3) present the results for expansion to new export destinations and Columns (4)-(6) present results for the survival of these export expansions. The marginal effect is calculated as dy/dx at the average value of each x in the sample. dy/dx stands for a discrete change from 0 to 1 when x is a dummy variable. Standard errors are clustered at the firm level. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level.