Export Entrepreneurship and Trade Structure in Latin America during Good and Bad Times

Ana M. Fernandes
Daniel Lederman
Mario Gutierrez-Rocha

The World Bank
Poverty Reduction and Economic Management Network,
Latin America and the Caribbean Region
&
Development Research Group
April 2013

Abstract

The authors use a new dataset on export transactions for a large set of Latin American and Caribbean and comparator countries to assess the extent of “export entrepreneurship” during periods of fast export growth (2005–2007) and depressed external demand (2008–2009). Export entrepreneurship is equated with the extensive margin of exports, namely the advent of new exporting firms, new export products, and new export market destinations. The main findings are: (1) annual exporter entry, exit, and survival rates in Latin America and the Caribbean are quite similar to what is observed in other countries, and entry rates across sectors are quite similar but survival rates appear to be highest in agriculture; (2) the relative size of entrants into export markets (relative to incumbents) tended to be lower for

natural resource-abundant countries during 2005–2007, but less so during the crisis years of 2008–2009; (3) entry rates tend to be lower in sectors in which a country has revealed comparative advantage, however, exit rates and survival rates of new exporters are higher in those sectors; and (4) the low growth of exports during the global recession of 2008–2009 in Latin America and the Caribbean was due to lower growth in exports of incumbent firms’ pre-existing products and destinations, while new products and destinations tended to attenuate the recession’s effects. Overall, the data suggest that the Latin American and Caribbean region appears to be no less entrepreneurial in terms of the extensive margins of exports than comparator countries.

This paper a joint product of the International Trade Department, Poverty Reduction and Economic Management Network; Office of the Chief Economist, Latin America and the Caribbean Region; and the Trade and International Integration Unit, Development Research Group. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at afernandes@worldbank.org and dlederman@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

Export Entrepreneurship and Trade Structure in Latin America during Good and Bad Times¹

Ana M. Fernandes²

Daniel Lederman³

Mario Gutierrez-Rocha⁴

Keywords: entrepreneurship, export growth, firm dynamics, trade structure, Latin America.

¹ Financial support from the Regional Studies Program of the Office of the Chief Economist for Latin American and the Caribbean (LCRCE) as well as from the governments of Norway, Sweden and the United Kingdom through the Multi-Donor Trust Fund for Trade and Development is gratefully acknowledged. This paper was prepared as a background paper for the LCRCE flagship report on *Unleashing LAC's Entrepreneurial Potential*. The authors would like to thank Jose Guilherme Reis, Julian Messina, Jamele Rigolini, Pablo Sanguinetti, Ernesto Stein and other participants in LCRCE's Authors' Workshop for comments. The opinions expressed in this paper are those of the authors and do not necessarily represent the views of the World Bank, its Board of Directors or the governments that it represents.

² Trade and International Integration, Development Research Group, World Bank (DECTI), afernandes@worldbank.org.

³ International Trade Department, World Bank (PRMTR), dllederman@worldbank.org.

⁴ Trade and International Integration, Development Research Group, World Bank (DECTI), mariogu@wharton.upenn.edu.

1. Introduction

Although the region's dependence on natural-resource exports is legendary, Latin America and the Caribbean (LAC) is composed of heterogeneous countries that differ in terms of size, trade structure and comparative advantage. Partly due to its comparative advantage in mining or agriculture, its history of economic thought is replete with pessimism about the region's ability to develop (see, e.g., the literature reviewed by Lederman and Maloney 2007). However, the literature has remained silent with respect to the role of entrepreneurship as a driver of export growth in developing countries with diverse trade structures. This paper utilizes a new dataset on export transactions (collected from customs agencies) for a large set of LAC and comparator countries to assess the extent of "export entrepreneurship" during periods of fast export growth (2005-2007) and depressed external demand (2008-2009). Following the broader literature, "export entrepreneurship" is equated with the extensive margin of exports, namely the advent of new exporting firms, new export products and new export-market destinations. The paper provides a series of novel stylized facts on export entrepreneurship in the LAC region by focusing on dimensions of entry into export markets, entry into exporting of new products and entry into new destination markets by incumbent exporting firms. We identify within-regional differences and benchmark LAC's export entrepreneurship relative to comparator countries in other regions, as well as cross-sectoral differences in export entrepreneurship.

We use novel exporter-level data from customs for 11 countries in the LAC region, including Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, and Peru from 2005 to 2009. The analyses consider two separate sub-periods: the steady export growth period of 2005-2007 and the period 2008-2009 characterized by the global financial crisis and the ensuing global recession. By examining the latter, this paper presents the first ever micro evidence on the effects of this major crisis on exporter dynamics in the LAC region. To benchmark the performance of the LAC countries, we selected comparators from around the world following a categorization of the LAC countries into three groups: (1) natural resource abundant countries (Chile, Colombia, Costa Rica, and Peru); (2) simple processing or assembly countries (Dominican Republic, El Salvador, Guatemala, and Nicaragua); and (3) countries with a broad manufacturing export base (Brazil and Mexico).⁵ Moreover, we consider broad averages for upper-middle and high-income countries [henceforth

⁵ See Section 4 for details on the criteria used to classify countries in these three groups.

designated as *higher income* countries] and for lower-middle and low-income countries [henceforth designated as *lower income* countries]. The analyses presented herein uncovered a wealth of stylized facts on export entrepreneurship in the LAC region. The subsequent paragraphs summarize the four main sets of findings related to different aspects of export entrepreneurship.

First, considering export entrepreneurship at the new firm margin, the average exporter entry and exit rates in the LAC region are 34% and 30%, respectively, during the steady growth period. The high exporter entry and exit rates across small and large, and more and less developed LAC countries suggest a dynamic entrepreneurial environment in the region with high levels of experimentation (entry) accompanied by similar levels of failure (exit) in export markets. First-year survival rates of new exporters in the LAC region are very low: on average only 54% of entrants into export markets survive to the next year. These patterns are, however, not a LAC feature, but instead are also present in their comparators in the groups of natural resource countries, assembly countries, and broad manufacturing export base countries, as well as in higher income countries. Strong dynamism in export entrepreneurship at the new product margin or at the new destination margin are also shown for incumbent exporters in LAC during the steady growth period: on average in a given year, more than a third (*a quarter*) of the products they exported (*destinations they served*) were not exported in the previous year, while 29% (17%) of the products they exported (*the destinations they served*) were dropped by the following year. The average first-year survival rate of new products exported by incumbent exporters in LAC was 28% while that of new destinations was 39%, indicating a tremendous degree of attrition along those two dimensions. Analyzing export entrepreneurship across broad sectors reveals that exporter entry rates and first-year survival rates in ores and metals sectors are not particularly high in LAC natural resource-abundant countries and are not higher than in industrial sectors though exit rates in ores and metals sectors are the lowest among all sectors in most LAC countries. Thus, while the boom in commodity prices in the late 2000s did not bring high entry into ores and metals sectors, possibly due to economies of scale and high entry costs, it might have helped reduce exit. Exporter entry rates in agriculture sectors are lower than in all other sectors across LAC countries but their first-year survival rates are substantially higher, and this is also the case in comparator countries.

Second, new entrants into export markets from the LAC region were extremely small relative to incumbent exporters in terms of export value during the steady growth period (e.g., less than 3% their size in Chile and Peru). Within LAC, new exporters were smaller in natural resource-abundant countries, which may be due to the large size of incumbent exporters (often large mining companies), and they were relatively smaller than those in lower income countries but relatively larger than those in higher income countries. Although incumbent exporters played a dominant role in explaining export growth in all LAC countries and comparators between 2005 and 2007, new exporters made a meaningful contribution in the countries experiencing moderate export growth (Costa Rica, Dominican Republic). Exports of new products and new destinations by incumbent exporters are also extremely small relative to exports of incumbent products in LAC countries. New products accounted for a meaningful share of export growth of incumbent exporters between 2005 and 2007 in the Dominican Republic, El Salvador, Guatemala, and Nicaragua, which may be linked to the Central America Free Trade Agreement (CAFTA) agreement with the United States whereby incumbent exporters gained access to a very large market. New destinations accounted for a meaningful share of export growth of incumbent exporters only in Ecuador, El Salvador, Guatemala, and Nicaragua. The share of new products or new destinations in accounting for export growth of incumbent exporters was smaller in LAC than in comparator countries.

Third, examining export entrepreneurship according to sectoral revealed comparative advantage shows that exporter entry rates are higher in sectors without comparative advantage in all LAC countries (except Costa Rica) but exporter exit rates are higher in sectors with comparative advantage in all LAC countries. In addition, first-year survival rates of new exporters are higher in sectors with comparative advantage in all LAC countries (except Costa Rica). These patterns suggest that exporters in the LAC region are engaging in a high degree of experimentation in 'non-traditional' sectors but the longer-lasting new export relationships occur in sectors with revealed comparative advantage, and this may be linked to learning spillovers due to the presence of networks of established exporters in the country. These patterns are, however, not a feature of the LAC region per se as they are also observed in comparator countries, thus signaling that we have uncovered general relationships between comparative advantage and exporting firm dynamics.

Finally, the global recession of 2008-2009 did not change entrepreneurship along the exporter dimension in terms of average entry rates in the LAC region. The crisis did increase moderately exit rates and reduced moderately average first-year survival rates of new exporters. Countries such as Chile and the Dominican Republic were more adversely affected along the exit dimension while Costa Rica and Guatemala were more adversely affected along the survival dimension. The crisis did not reduce export entrepreneurship by incumbent exporters along the product and destination margins in the LAC region but it did increase product exit rates in some countries (particularly the Dominican Republic) as well as destination exit rates (though only in the Dominican Republic). However, most of the decline in exports of incumbent exporters during the recession -- which itself accounted for the bulk of the decline in total exports of LAC countries -- was due to declines in the exports of those firms' pre-existing products and destinations, while new products and destinations tended to attenuate the negative effects of the recession. Moreover, the crisis fostered entrepreneurship by incumbent exporters in LAC processing countries and in Ecuador which experienced positive export growth mostly accounted for by their new products and new destinations.

The literature on cross-country comparisons and benchmarking of entrepreneurship in trade is thin, particularly with micro data, mostly because of difficulties in gathering comparable data across a large number of countries. Some studies examine the role of the extensive margin in export growth using more or less disaggregate trade flow data from WITS/COMTRADE across countries (see, e.g., Besedes and Prusa 2010, Felbermayr and Kohler 2006, Helpman, Melitz and Rubenstein 2008, Hummels and Klenow 2005).⁶ These studies generally find the intensive margin to be more important in explaining export growth, but this consensus should not be interpreted as indicating that the extensive margin does not play a role. For example, Besedes and Prusa (2010) show that differences along the extensive margin (at the product-destination level) are particularly prevalent across developing countries but are often accompanied by a very short duration of most new export relationships. A handful of recent studies using firm-level customs datasets study the role of the extensive margin in export growth for certain, including Alvarez and Fuentes on Chile (2011), Eaton, Eslava, Kugler, and Tybout on Colombia (2008), and Lederman, Rodriguez-Clare, and Xu on Costa Rica (2011).

⁶ Amiti and Freund (2010) use trade flow data for China to study the importance of the intensive margin.

Eaton, Eslava, Kugler, and Tybout (2008) show that in any given year more than half of Colombian exporters are new entrants but total export growth results mostly from the intensive margin (i.e., the expansion of incumbent exporters). The interpretation is that new firms export small amounts and face high export failure rates. Lederman, Rodriguez-Clare, and Xu (2011) find that during 1997-2007 the main driver of total export growth in Costa Rica is the introduction of new products by incumbent firms but the contributions of new exporters and new products explain less than a tenth of total export growth. Freund and Pierola (2009) examine exporter entry into products and destination markets not previously served by focusing on non-traditional agriculture in Peru during a period of very rapid growth. They show tremendous exporter entry and entry into new destination markets also accompanied by high exit rates (interpreted as trial and error) but they find lower entry rates into new products.

There is no consensus in the literature on the definition of the extensive margin of exports or export entrepreneurship (as discussed in Lederman, Rodriguez-Clare, and Xu, 2011) or entry channel (as designated in Besedes and Prusa, 2010). This lack of consensus often leads to different and non-comparable results across studies. Some equate the extensive margin with changes in the number of exporters, others focus on changes in the number of products exported, and yet others assess the number of export destinations (countries). This study takes a broad approach covering multiple dimensions of the extensive margin of national exports.

As far as we know, this is the first ever LAC comparative study on export entrepreneurship with comparable data and a uniform methodology across countries. In addition, there are no other papers that cover the effects of the global financial crisis of 2008-09 on export entrepreneurship in LAC (or any other country). Furthermore, this is the first systematic analysis of exporting firm turnover and survival by sectors across a large number of countries.

The rest of the paper is organized as follows. Section 2 describes the data and Section 3 describes the methodology. The results on export entrepreneurship at the country level focusing on the firm margin are presented in Section 4, the results focusing on the product margin are presented in Section 5, and the results focusing on the destination margin are presented in Section 6. Section 7 discusses the results on export entrepreneurship across sectoral typologies. Section 8 concludes.

2. Data

We use new exporter-level data from customs for 11 countries in the LAC region, including Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, and Peru covering the 2000s. These data are part of the new *Exporter Dynamics Database* presented in Cebeci, Fernandes, Freund, and Pierola (2012). The starting point for the construction of the database is raw exporter-level customs datasets generally obtained from national customs agencies, and the data cover the universe of transactions in each country. Each country dataset provides information at the exporter-product-destination-year level based on six variables: country of origin, exporting firm identifier, country of destination, product, export value, and year.⁷ The raw exporter-level datasets were subjected to uniform reformatting and to a series of cleaning procedures. A few key aspects are discussed below by highlighting the specificities of LAC countries, but further details are provided in Cebeci, Fernandes, Freund, and Pierola (2012).

Firms were identified by their actual names, their tax identification number, or artificial unique codes randomly created by the local customs agency. These codes allow us to follow firms over time and create a panel for each country.⁸ Regarding the destination country, Colombia, Costa Rica, Ecuador, and Peru use a special trade regime whereby firms' sales to their free zones/customs warehouses are recorded by customs as exports, but we exclude this type of transaction from those countries' datasets.⁹ Regarding product nomenclatures, we use a time-consistent 'consolidated' Harmonized System (HS) classification at the 6-digit level that concords and harmonizes product codes across the HS 1996, 2002, and 2007 versions (used in the raw exporter-level datasets).¹⁰ Export values are measured in US dollars (USD) converted from local currency when necessary using official exchange rates from the IMF's *International Financial Statistics*. Export values for all LAC countries are Freight on Board (FOB) figures

⁷ For some countries, namely Brazil, Egypt, Estonia, Laos, New Zealand, Norway, Portugal, Spain, Sweden, and Turkey, the indicators were calculated without having permanent access to the customs data at the exporter-product-destination-year level.

⁸ The firm coding system was changed in Mexico in 2007, thus it is not possible to calculate exporter dynamics indicators such as exporter entry rates in 2007 for Mexico.

⁹ The "special trade system" refers to the recording of transactions where the goods enter or exit the domestic territory in free circulation (customs warehouses, free zones and goods under contract for inward or outward processing). In contrast, the "general trade system" refers to the recording of all other transactions of goods passing the border in their trade statistics, except for transit, trans-shipment and temporary admission transactions (see p. 32 of United Nations, 2008). The exclusion of special trade regime transactions has a minor effect on total exports in those countries given that sales to free zones/customs warehouses are generally negligible.

¹⁰ See Cebeci (2012) for the details on this consolidation. A list of the unique 4767 consolidated codes and concordances are available at <http://econ.worldbank.org/exporter-dynamics-database>.

except for El Salvador, whose exports are Cost, Insurance and Freight (CIF) figures. Finally, we consider the universe of export transactions in agricultural, mining, and manufacturing sectors but we exclude exports in HS Chapter 27 (hydrocarbons such as oil, petroleum, natural gas, coal etc.). Cebeci, Fernandes, Freund, and Pierola (2012) argue that the raw exporter-level datasets are reliable based on comparisons of export totals (excluding HS 27) with export flows in the WITS/COMTRADE database (excluding HS 27) for each country and year.

Three remarks on the data are worth mentioning. First, to filter out potential noise and focus on true entrepreneurial ventures in export markets (rather than for example the shipping of samples or other small shipments) we drop from the sample in each country exporting firms whose total export values are lower than 500 USD in all their years in the sample. Second, in the case of Costa Rica we exclude the largest exporting firm (INTEL) from the sample in each year, following Lederman, Rodriguez-Clare, and Xu (2011).¹¹ Third, in the case of Nicaragua our dataset includes firms located in Export Processing Zones even though exports reported to WITS/COMTRADE by that country exclude the exports from those firms.¹²

The analyses cover two time periods: (i) the period 2005-2007 which has the greatest coverage across LAC countries and represents a growth period or ‘normal times’ and (ii) the period 2008-2009 which covers the global financial crisis that started in 2008 and allows us to present for the first time evidence on the effects of a major crisis on export entrepreneurship in emerging economies.¹³

3. Methodology

The first objective is to describe recent patterns of export entrepreneurship in LAC countries using the list of indicators defined in Table 1. Those indicators defined at the country-year level are analyzed in Section 3 while indicators defined at the country-year-product level are analyzed in Section 4.¹⁴

¹¹ Lederman, Rodriguez-Clare and Xu (2011) excluded the products that were probably exported by INTEL and Abbot Labs during 1997-2007, because these multinational firms began operations in 1998 and thus dominate any analysis of the contribution of export entrepreneurship. Since the story of these cases is relatively well known, our interest is to assess entrepreneurship among the rest of the firms in Costa Rica.

¹² Indicators for Nicaragua in the *Exporter Dynamics Database* are calculated excluding firms located in Export Processing Zones given the criterion of data quality used which is the match between the total exports calculated based on the exporter-level customs data and the total exports reported in WITS/COMTRADE.

¹³ For Ecuador in the period 2005-2007 only years 2006 and 2007 are available.

¹⁴ In addition to the indicators listed in Table 1, Section 4.1 mentions the average number of HS 6-digit products per type of firm (exporter, entrant, incumbent) and the average number of destinations per type of firm (exporter, entrant, incumbent).

Table 1: Types of Firms and Indicators of Export Entrepreneurship**Panel A. Types of Firms**

Exporter in t	A firm that exports in year t
Entrant in t	A firm that does not export in year t-1 but exports in year t
Exiter in t	A firm that exports in year t-1 but does not export in year t
Incumbent in t	A firm that exports in both years t-1 and t
2-Year Incumbent in t	A firm that exports in years t-1, t and t+1
Survivor in t	A firm that does not export in year t-1 but exports in both years t and t+1

Panel B. Indicators

Exporter Dynamics	
Firm Entry Rate in t	$N. \text{ Entrants in year } t / N. \text{ Exporters in year } t$
Firm Exit Rate in t	$N. \text{ Exiters in year } t / N. \text{ Exporters in year } t-1$
Firm Survival Rate in t	$N. \text{ Survivors in year } t / N. \text{ Entrants in year } t$
Relative Size of Entrants in t	$\text{Average export value per Entrant} / \text{Average export value per Incumbent}$
Product Dynamics for Incumbents Exporters	
Average Product Entry Rate in t	Average (across Incumbents) of (Number of products not exported in t-1 but exported in t by an incumbent / Number of all products exported by the same Incumbent in t)
Average Product Exit Rate in t	Average (across Incumbents) of (Number of products exported in t-1 but not exported in t by an incumbent / Number of all products exported by the same Incumbent in t-1)
Average Product Survival Rate in t	Average (across Incumbents) of (Number of products not exported in t-1 but exported in both t and t+1 by a 2-year Incumbent / Number of all products not exported in t-1 but exported in t by the same 2-year Incumbent)
Relative Size of New Products in t	Average (across Incumbents) of (Value of exports of products not exported in t-1 but exported in t by an Incumbent / Total export value of the same Incumbent in t)
Destination Dynamics for Incumbent Exporters	
Average Destination Entry Rate in t	Average (across Incumbents) of (Number of destinations not served in t-1 but served in t by an incumbent / Number of all destinations served by the same Incumbent in t)
Average Destination Exit Rate in t	Average (across Incumbents) of (Number of destinations served in t-1 but not served in t by an incumbent / Number of all Destinations served by the same Incumbent in t)
Average Destination Survival Rate in t	Average (across Incumbents) of (Number of destinations not served in t-1 but served in both t and t+1 by a 2-year Incumbent / Number of all Destinations not served in t-1 but served in t by the same 2-year Incumbent)
Relative Size of New Destinations in t	Average (across Incumbents) of (Value of exports to destinations not served in t-1 but served in t by an Incumbent / Total export value of the same Incumbent in t)

The second objective is to quantify the contribution of export entrepreneurship to recent total annual export growth. Specifically, we conduct a decomposition analysis of annual export growth following Eaton, Eslava, Kugler, and Tybout (2008) and Lederman, Rodriguez-Clare, and Xu (2011). For a given country the export growth decomposition along the exporter dimension can be formalized as:

$$\begin{aligned} \frac{X_t - X_{t-k}}{0.5(X_{t-k} + X_t)} = & \left(\frac{0.5(X_{t-k}^C + X_t^C)}{0.5(X_{t-k} + X_t)} * \frac{X_t^C - X_{t-k}^C}{0.5(X_{t-k}^C + X_t^C)} \right) + \left(\frac{NE_{t-k} * \overline{X_{t-k}}}{0.5(X_{t-k} + X_t)} + \frac{X_t^E - NE_{t-k} * \overline{X_{t-k}}}{0.5(X_{t-k} + X_t)} \right) \\ & + \left(-\frac{NX_{t-k} * \overline{X_{t-k}}}{0.5(X_{t-k} + X_t)} - \frac{X_{t-k}^X - NX_{t-k} * \overline{X_{t-k}}}{0.5(X_{t-k} + X_t)} \right) \end{aligned} \quad (1)$$

where X_t and X_{t-k} are total exports in years t and $t-k$, $\overline{X_{t-k}}$ are average exports (across exporters) in year $t-k$, C indexes variables for incumbent exporters active in export markets in both $t-k$ and t , E indexes variables for entrant/new exporters active in export markets in t but not in $t-k$, and D indexes variables for exiting exporters active in export markets in $t-k$ but not in t , while NE and NX are the numbers of entrant and exiting exporters, respectively. The first term in Eq. (1) (the product of the share of exports of incumbent exports and their average export growth) equals the contribution of incumbent exporters to total export growth.

The second term in Eq. (1) (the sum of (i) the number of new exporters as a share of the average number of exporters in the 2 years and (ii) the deviation of the average exports of new exporters from the average exports of incumbent exporters) is the contribution of new exporters to total export growth. The third term in Eq. (1) (the sum of (i) the number of exiting exporters as a share of the average number of exporters in the 2 years and (ii) the deviation of the average exports of exiting exporters from the average exports of incumbent exporters) gives the contribution of exiting exporters to total export growth.

We use a second decomposition similar to Eq. (1) to explain export growth of incumbent exporters considering entry and exit along the HS 6-digit product dimension:

$$\begin{aligned} \frac{X_t^C - X_{t-k}^C}{0.5(X_{t-k}^C + X_t^C)} = & \left(\frac{0.5(X_{t-k}^{CP} + X_t^{CP})}{0.5(X_{t-k}^C + X_t^C)} * \frac{X_t^{CP} - X_{t-k}^{CP}}{0.5(X_{t-k}^{CP} + X_t^{CP})} \right) + \left(\frac{NEP_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} + \frac{X_t^{CEP} - NEP_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} \right) \\ & + \left(-\frac{NXP_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} - \frac{X_{t-k}^{XCP} - NXP_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} \right) \end{aligned} \quad (2)$$

The variables and indexes are defined as above, $\overline{X_{t-k}^C}$ are average exports of incumbent exporters in year $t-k$, CP indexes variables for incumbent products exported by incumbent exporters in both $t-k$ and t , EP indexes variables for entrant/new products exported by incumbent exporters in t but not in $t-k$, DP indexes variables for exiting products exported by incumbent exporters in $t-k$ but not in t , and NEP and NXP are the numbers of new and departing products of incumbent

exporters, respectively. The first, second, and third terms in Eq. (2) provide, respectively, the contribution of incumbent products, new products, and exiting products to total export growth of incumbent exporters.

A third decomposition parallels Eq. (1) but focuses on export growth of incumbent exporting firms by considering the entry and exit along the destination dimension. This decomposition is given by:

$$\begin{aligned} \frac{X_t^C - X_{t-k}^C}{0.5(X_{t-k}^C + X_t^C)} = & \left(\frac{0.5(X_{t-k}^{CD} + X_t^{CD})}{0.5(X_{t-k}^{CD} + X_t^{CD})} * \frac{X_t^{CD} - X_{t-k}^{CD}}{0.5(X_{t-k}^C + X_t^C)} \right) + \left(\frac{NED_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} + \frac{X_t^{ED} - NED_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} \right) \\ & + \left(-\frac{NXD_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} - \frac{X_{t-k}^{XD} - NXD_{t-k} * \overline{X_{t-k}^C}}{0.5(X_{t-k}^C + X_t^C)} \right) \end{aligned} \quad (3)$$

where the variables and indexes are defined as above, *CD* indexes variables for incumbent destinations exported by incumbent exporters both *t-k* and *t*, *ED* indexes variables for entrant/new destinations exported by incumbent exporters in *t* but not in *t-k*, and *XD* indexes variables for departing destinations exported by incumbent exporters in *t-k* but not in *t*, while *NED* and *NXD* are the numbers of new and departing destinations of incumbent exporters, respectively. The first, second, and third terms in Eq. (3) equal, respectively, the contribution of incumbent destinations, new destinations, and exiting destinations to total export growth of incumbent exporters.

We compute the decompositions in Eqs. (1)-(3) for export growth during 2005-2007 and 2008-2009. For 2005-2007, we compute the decompositions for each of the three pairs of years 2004-2005, 2005-2006, and 2006-2007 and take an average across these three, and for 2008-2009 we compute the decompositions for 2007-2008 and 2008-2009 and take an average across these two.¹⁵

Subsequent analyses assess the relative contributions of incumbent exporters, new exporters, and exiting exporters to total export growth in each country, obtained as the ratio of each of the terms on the left-hand-side of Eq. (1). Similarly, we discuss the relative contributions of incumbent products, new products, and exiting products to total export growth in each country, obtained as the ratio of each of the terms on the left-hand-side of Eq. (2). Finally, we present the relative contributions of incumbent destinations, new destinations, and exiting

¹⁵ For Ecuador due to limited data, the decompositions in the period 2005-2007 are conducted just for 2006-2007.

destinations to total export growth in each country, obtained as the ratio of each of the terms to the left-hand-side of Eq. (3).

To provide insights into the role of new exporters, new products, and new destinations, we conduct complementary decompositions of their contribution to total exports that take into account the permanence of new export flows. Assuming $k=1$ in the above decompositions and considering the new exporting firms, we separate them into two groups: those that continue to export in $t+1$ and those that do not export in $t+1$. We then decompose the contribution of new exporters to total export growth into the contribution of entering and exiting exporting firms. Similarly, we separate new products of incumbent exporters into two groups: those that continue to be exported by incumbent exporters in $t+1$ and those that are not exported in $t+1$. We then decompose the contribution of new products to total export growth of incumbent exporters into the contribution of new and departing products. Likewise, we separate new destinations of incumbent exporters into two groups: those that continue to be served by incumbent exporters in $t+1$ and those that cease to be served in $t+1$. We then decompose the contribution of new and departing destinations to total export growth of incumbent exporters. We compute these complementary decompositions for the period 2005-2007 as described above for Eqs. (1)-(3).

4. Export Entrepreneurship across LAC Countries along the New Exporter Dimension

This section examines patterns of export entrepreneurship in LAC countries by focusing on the extensive margin in terms of new firms entering export markets. To facilitate international comparisons with the LAC countries we selected comparators from around the world for three types of economies: (1) natural resource countries that include Chile, Colombia, Peru, and Costa Rica from LAC; (2) simple processing or assembly economies with Guatemala, Dominican Republic, El Salvador, and Nicaragua; and (3) countries with a broad export manufacturing base, including Brazil and Mexico.¹⁶ The natural resource countries were chosen based on net exports of natural resources during 1980-2005 (see Lederman and Maloney, 2012).¹⁷ The simple processing countries have high shares of exports of apparel and textiles in their total exports,

¹⁶ The comparators selected are based on the availability of data on export entrepreneurship in the Exporter Dynamics Database.

¹⁷ It is noteworthy that most LAC countries are net exporters of energy, mining or agriculture. In the case of Costa Rica, the economy is a net exporter of various agricultural commodities. It is also a major exporter of superconductors due to an INTEL plant. However, we work with data that excludes INTEL following existing literature (e.g., Lederman, Rodriguez-Clare and Xu 2012), partly because the story of INTEL is well known. Furthermore, although Brazil and Mexico are also net exporters of commodities, they have much more diversified export structures (as measured by the standard indicators, such as the Herfindahl index of export-revenue concentration) as well as high shares of manufactured exports over total merchandise exports.

according to WITS/COMTRADE.¹⁸ The countries with a broad manufacturing export base have high shares of manufacturing exports in merchandise exports, according to the *World Development Indicators* across the period 1990-2010. In addition to comparator countries in each of these groups, the graphs below include a bar labeled ‘LAC countries’ showing the average across the LAC countries, a bar labeled ‘World Higher’ showing the average across higher income countries in the *Exporter Dynamics Database*, and a bar labeled ‘World Lower’ showing the average across lower income countries in database.¹⁹

4.1 Characteristics of Exporting Sectors and Exporters

Before examining the patterns of export entrepreneurship, it is worth documenting the diversity of characteristics across exporting sectors and exporters in the LAC region. Panels A and B of Figure 1 show the number of exporters in LAC and comparator countries in the two periods 2005-2007 and 2008-2009. The largest pools of exporters are found in the group of (large) broad manufacturing base countries Mexico and Brazil (close to or more than 20,000). While these two countries’ rates are lower than the comparators Spain and Turkey, they are actually higher than the average for higher income countries. Colombia is the LAC country with the largest number of exporters in the group of natural resource countries (in Panel B), though substantially smaller than those of richer South Africa and New Zealand. The smallest pool of exporters (about 1,243) is found in Nicaragua and in the other simple processing countries, though their pools of exporters are much larger than those of the comparator Cambodia. The average numbers of exporters in Panels A and B are quite similar suggesting that no major changes took place across the two periods.

Panels C and D of Figure 1 show average exports per firm in LAC and comparator countries in 2005-2007 and 2008-2009. Average exports per firm were the highest (above 7 million USD) in Brazil and Chile and the lowest in Guatemala and Nicaragua (about 1.3 million USD).²⁰ Chile and Peru, as well as Brazil and Mexico exhibited substantially higher average exports per firm than their comparators in the respective groups of natural resource countries and

¹⁸ While Mexico could be classified as a simple processing country due to the importance of the maquila sector for its economy, we chose to classify it as a country with a broad manufacturing base.

¹⁹ The countries entering the ‘World Higher’ average and ‘World Lower’ average are listed in the notes to the figures.

²⁰ Note that the exporter size distributions are highly skewed in all countries, with a few very large exporters driving total exports, thus average exports per firm and median exports per firm differ tremendously as shown in Appendix A. However, considering the median Brazil still exhibits the largest exporters.

broad manufacturing export base countries. Among processing countries, the LAC countries had lower average exporter size than their comparators. For any given LAC or comparator country, the average exporter sizes were quite similar across the two periods shown in Panels C and D. Overall, the patterns emerging from Figure 1 across the spectrum of LAC countries are not surprising given the large differences in country sizes and levels of development within the region. The ranking of countries within LAC mirrors to a large extent their level of development.

Figure 1: Total Number of Exporters and Average Exporter Size
Panel A. Number - Averages in 2005-2007 **Panel B. Number - Averages in 2008-2009**

Notes: in Panels A and C the averages for Ecuador cover 2006-2007. Colombia does not enter in Panels A and C due to lack of data. Panels C and D show average exports per exporter expressed in USD. The countries entering the average in the bar labeled 'World Higher' are Albania, Belgium, Bulgaria, Brazil, Botswana, Chile, Colombia, Costa Rica, Dominican Republic, Estonia, Iran, Jordan, Kuwait, Lebanon, Mexico, Macedonia, Mauritius, Norway, New Zealand, Peru, Portugal, Spain, Sweden, Turkey and South Africa. The countries entering the average in the bar labeled 'World Lower' are: Burkina Faso, Bangladesh, Cameroon, Ecuador, Egypt, El Salvador, Guatemala, Kenya, Cambodia, Lao, Morocco, Malawi, Mali, Niger, Nicaragua, Pakistan, Senegal, Tanzania, Uganda, Yemen.

4.2 Exporter Entry, Exit and First-Year Survival Rates

To examine the degree of export entrepreneurship across LAC countries, we present in Panels A and B of Figure 2 the average exporter entry rates in each country during 2005-2007 and 2008-2009. The entry rates were high in absolute terms in the LAC region during the steady growth period in Panel A: on average 32% of exporters in a given year were new entrants. This LAC average was lower but close to that of higher income countries but was substantially lower than the average of lower income countries (45%). Within LAC, entry rates were somewhat higher on average in natural resource countries but were closely followed by those in processing countries. Three LAC countries – Peru, Ecuador, and the Dominican Republic - exhibited higher exporter entry rates than all comparators in the respective groups of natural resource countries and processing countries in the steady growth period. Among broad manufacturing export base countries, Mexico's entry rate was lower only relative to Spain, while Brazil exhibited the lowest entry rate (22%) among all countries. Panel B of Figure 2 shows that the global recession left average exporter entry rates in the LAC region almost unchanged. Only in Costa Rica was export entrepreneurship significantly negatively affected by the crisis, with entry rates shrinking by 9 percentage points from 33% in 2005-2007 to 24% in 2008-2009.

The high entry rates in Panel A of Figure 3 signal a dynamic entrepreneurial environment in the LAC region during both periods (despite lower entry rates during the latter years). For contrast, we present in Panels C and D of Figure 3 exporter exit rates for each country. During the steady growth period, exit rates were very high in absolute terms in all LAC countries: on average in a given year 30% of the firms that were exporting in the previous year quit the export market. That LAC average was close to that of higher income countries but lower than that of lower income countries. Within LAC, exit rates were somewhat higher in natural resource countries but were closely followed by those in processing countries. Among natural resource countries, Costa Rica exhibited the lowest exit rate (25%), whereas among processing countries, the Dominican Republic exhibited the highest exit rate (38%), which was substantively higher than that of its comparator Bangladesh (24%). Among broad manufacturing export base countries, Mexico's exit rate was lower only than that of Spain, while Brazil exhibited the lowest exit rate (24%). Panel D shows that the global recession increased exporter exit rates in the LAC region slightly but the average masks important heterogeneity across countries. Exit rates increased particularly strongly in Chile and the Dominican Republic, respectively from 31% and 38% in 2005-2007 to 39% and 45% in 2008-2009.

Figure 2: Exporter Entry, Exit, and First-Year Survival Rates

Panel A. Entry - Averages in 2005-2007

Panel B. Entry - Averages in 2008-2009

Panel C. Exit - Averages in 2005-2007

Panel D. Exit - Averages in 2008-2009

Panel E. Survival - Averages in 2005-2007

Panel F. Survival - Averages in 2008-2009

Notes: in Panels A, C, and E the averages for Ecuador cover 2006-2007. Colombia does not enter in Panels A, C, and E due to lack of data. The countries entering the average in the bar labeled 'World Higher' are Albania, Belgium, Bulgaria, Brazil, Botswana, Chile, Colombia, Costa Rica, Dominican Republic, Estonia, Iran, Jordan, Kuwait, Lebanon, Mexico, Macedonia, Mauritius, Norway, New Zealand, Peru, Portugal, Spain, Sweden, Turkey and South Africa. The countries entering the average in the bar labeled 'World Lower' are: Burkina Faso, Bangladesh, Cameroon, Ecuador, Egypt, El Salvador, Guatemala, Kenya, Cambodia, Lao, Morocco, Malawi, Mali, Niger, Nicaragua, Pakistan, Senegal, Tanzania, Uganda, Yemen.

To assess the sustainability of export entrepreneurship identified above through the entry rates of exporters, Panels E and F of Figure 3 examine the first-year survival rates of new exporters during 2005-2007 and 2008-2009. The low survival rates of new exporters during the steady growth period are striking: after one year in export markets on average only 53% of entrants in the LAC region survived into the following year. This attrition rate among new exporters was, however, not an exclusive feature of LAC. In fact, the first-year survival rate of new exporters was on average higher in LAC than in higher income and lower income countries. Within LAC, survival rates were not particularly higher in any of the three groups of countries. The performance of LAC countries within the group of natural resource countries was quite heterogeneous, with Costa Rica showing the highest survival rate (54%) and Chile showing the lowest survival rate (38%). LAC countries exhibited the lowest survival rates within the group of processing countries, more than 10 percentage points lower than those of comparators Bangladesh and Cambodia. In particular, the rate for the Dominican Republic implies that 61% of new entrants disappeared after just one year in export markets. Brazil's survival rate of new exporters was the highest within the LAC region and was higher than that of its comparators Egypt and Turkey. Panel F shows that the global recession reduced but moderately the survival rates of new exporters in the LAC region. However, Costa Rica and Guatemala were more adversely affected with survival rates declining from 54% and 45% in 2005-2007 to 45% and 37% in 2008-2009.

4.3 Size of New Exporters and Contribution to Total Export Growth

To characterize entrants into export markets in the LAC region, Panels A and B of Figure 3 show the average size of new exporters relative to the average size of incumbent exporters in terms of export value during 2005-2007 and 2008-2009.²¹ Entrants into export markets were extremely small in some countries during the steady growth period (3% or less the size of incumbents in Chile and Peru) but were larger in other countries (17% the size of incumbents in Brazil). New exporters in the LAC region were relatively smaller than those in lower income countries but were - perhaps surprisingly - larger than those in higher income countries. Within LAC, new exporters tended to be smaller in natural resource countries, which may be due to the fact that in these countries incumbents are often very large mining or other multinational

²¹ Average and median sizes of entrant and incumbent exporters for the LAC countries are shown in Appendix A.

companies which drive up the average size and thus the denominator of the relative size of new exporters. Section 7 will examine the role of economic sectors in determining the nature of export entrepreneurship. The performance of LAC countries within the group of natural resource countries was, however, quite diverse, with Ecuador exhibiting the largest new exporters and Peru the smallest new exporters. Among processing countries, LAC countries had the smallest new exporters. Although Brazil's new exporters were the largest within the LAC region and were larger than in comparator countries, Mexico's new exporters were much smaller than those of its comparators Turkey and Egypt. Panel B shows that during the global recession the size of new exporters increased in several of the most developed LAC countries (Brazil, Costa Rica, Mexico, Peru) but shrank in all the least developed LAC countries (El Salvador and especially Guatemala and Nicaragua).

Notes: the size of exporters is measured by the export value per firm. In Panel A the average for Ecuador covers 2006-2007. Colombia does not enter in Panel A due to lack of data. The countries entering the average in the bar labeled 'World Higher' are Albania, Belgium, Bulgaria, Brazil, Botswana, Chile, Colombia, Costa Rica, Dominican Republic, Estonia, Iran, Jordan, Kuwait, Lebanon, Mexico, Macedonia, Mauritius, Norway, New Zealand, Peru, Portugal, Spain, Sweden, Turkey and South Africa. The countries entering the average in the bar labeled 'World Lower' are: Burkina Faso, Bangladesh, Cameroon, Ecuador, Egypt, El Salvador, Guatemala, Kenya, Cambodia, Lao, Morocco, Malawi, Mali, Niger, Nicaragua, Pakistan, Senegal, Tanzania, Uganda, Yemen.

A potential concern with the very small average size of new exporters in LAC countries (as well as in comparator countries) is that such average is calculated across firms entering export markets in different months of the year. If firms that start exporting in January export larger values in that entry year than firms that start exporting in December and if there is seasonality in entry with more firms entering in months in the second half of the year, then the

average size of exporters in their entry year could be underestimated. We investigate this possibility in the case of Peru, for which we have access to monthly export transaction data and find that in any given year (i) entrants are very small (relative to incumbents) regardless of the month when they start exporting and (ii) the probability of entering export markets is quite similar across months. Appendix B provides further details.

A final element in the analysis of export entrepreneurship at the firm-level is the contribution of new exporters to short-run export growth. Figure 4 shows the average annual growth rate of total exports for each country in the period 2005-2007 in Panel A and 2008-2009 in Panel B. The average contribution of the three terms in the export growth decomposition -- for new, incumbent, and exiting exporters; see Eq. (1) -- is presented for each country with Panel C covering 2005-2007 and Panel D covering 2008-2009.²² During the steady growth period, incumbent exporters played a dominant role in explaining export growth in all LAC countries, which was also the case for all comparator countries in the groups of natural resource countries, processing countries and broad manufacturing export base countries. This finding confirms the evidence found for individual rich countries (such as the U.S. by Bernard, Jensen, Redding, and Schott, 2009). New exporters contributed very little to export growth in Chile, Peru, and Costa Rica but played a non-negligible role in the Dominican Republic, and to a lesser extent in Brazil, Ecuador, Guatemala, Nicaragua as well as in Bangladesh and Cambodia, the comparators for processing countries. Exiting exporters reduced total export growth importantly in Costa Rica and Ecuador, as well as in the comparator for broad manufacturing export base countries, Egypt. All in all, the contribution of new exporters was more important in LAC countries experiencing moderate export growth (Costa Rica, Dominican Republic) than in LAC countries experiencing fast export growth (Chile, Peru) between 2005 and 2007.

During the global recession, average export growth was lower (as expected) in fact negative for the most developed LAC countries, Brazil, Chile, Costa Rica, Colombia, Mexico, and Peru. Incumbent exporters played a dominant role in explaining the export decline in those countries (except Costa Rica) and in explaining export increases in Ecuador and Nicaragua. Exiting exporters contributed importantly to the export decline in Brazil and Costa Rica and to reduce export growth in the Dominican Republic, Guatemala, and Nicaragua during the crisis.

²² Several comparator countries included in Figures 1-3 are excluded from Figure 4 due to data limitations.

Figure 4: Total Export Growth and its Decomposition
Panel A. Exp. Growth in 2005-2007 **Panel B. Exp. Growth in 2008-2009**

Panel C. Decomposition in 2005-2007 **Panel D. Decomposition in 2008-2009**

Panel E. New Exp. Contrib. in 2005-2007

Notes: panels A and B and C and D show, respectively, averages across the period 2005-2007 for each country (2006-2007 for Ecuador) and 2008-2009 as described in Section 3. Colombia does not enter in Panels A, C, and E due to lack of data. For each country the sum of the numbers shown in each part of the bar in Panel C (*Panel D*) adds up to the total shown on top of the bar in Panel A (*Panel B*). For each country, the sum of the numbers shown in each part of the bar in Panel E adds up to the total shown in the entrant part of the bars in Panel C.

Dissecting further the role of new exporters for export growth, Panel E of Figure 4 shows a strong pattern during the steady growth period: the contribution of new exporters was accounted for mostly by the more long-lasting exporters, i.e., those that continued to export in $t+1$ in all LAC countries.²³ Longer-term export growth decompositions would be more likely to show significant contributions of firm entry to export growth. That is indeed the finding obtained for Chile by Alvarez and Fuentes (2009) and for Costa Rica by Lederman, Rodriguez-Clare, and Xu (2011) and may be pursued in future research.

This evidence for firms in LAC countries which operate in export markets is in line with the evidence from the industry dynamics literature (focused on firms operating in domestic markets): new firms start small and suffer a high probability of exit in their initial years (Caves, 1998). It is also consistent with evidence from the growing export dynamics literature (e.g., Eaton, Kortum, and Kramarz, 2007; Lederman, Rodriguez-Clare, and Xu, 2011). Entry and exit into export markets should theoretically be influenced by two forces: fixed costs to enter export markets and uncertainty about the profitability of export markets. While fixed costs deter entry, the possibility of success improves it. Therefore, one can expect to see higher entry rates when either fixed costs are low or uncertainty is high. In those cases, however, exit rates are also likely to be high because weaker (possibly less productive) firms enter when entry costs are low or when the probability of a high payoff is high. What the evidence for the LAC region suggests is that the sunk costs of entering export markets that play such a crucial role in the models of heterogeneous firms and trade pioneered by Eaton and Kortum (2002) and Melitz (2003) do not seem to be very large in practice, or at least appear to play a less dominant role than uncertainty about export success.

5. Export Entrepreneurship across LAC Countries along the New Product Dimension

Export entrepreneurship is present also when incumbent exporters export new products. To examine this dimension of entrepreneurship, we focus on incumbent exporters (as defined in Table 1) in each country and consider products defined at the 6-digit HS disaggregation level.²⁴

²³ The decomposition of the contribution of new exporters during the crisis period is not presented due to the lack of data for 2010 for most LAC countries which would be necessary to calculate the survival of new exporters into the year following 2009.

²⁴ Brazil, New Zealand, and Spain are not used in this section given that we do not have access to the raw exporter-level customs data for those countries necessary to compute the measures used here. Egypt is also not used as a comparator given that its exporter-level customs data is provided with a 4-digit HS (instead of a 6-digit HS) level of disaggregation.

5.1 Product Entry, Exit and Survival Rates

Panels A and B of Figure 5 present product entry rates for incumbent exporters in each country during 2005-2007 and 2008-2009.²⁵ A tremendous degree of experimentation along the product dimension was displayed by incumbent exporters in LAC during the steady growth period: on average more than a third of the products exported by incumbents in a given year were not exported in the previous year. Within LAC, the rates of new product introduction by incumbent exporters were somewhat higher in processing countries, with the Dominican Republic exhibiting the highest rate (42%). However, within the group of natural resource countries, incumbent exporters in LAC countries exhibited product entry rates that were lower by more than 20 percentage points than those in South Africa. Panel B reveals that the global recession did not reduce export entrepreneurship by incumbent exporters along the product dimension in the LAC region as an average and in fact it increased it in a few countries (Costa Rica, Dominican Republic, and Guatemala).

To contrast with the patterns based on product entry rates, we present product exit rates for incumbent exporters in each country in Panels C and D of Figure 5 for 2005-2007 and 2008-2009. During the steady growth period, product exit rates were high in all LAC countries: on average 29% of the products exported by incumbents in a given year were dropped by the following year. Within LAC, product exit rates were similar across the different groups of countries. Among natural resource countries, incumbent exporters in LAC countries exhibited lower product exit rates by more than 20 percentage points than those in South Africa. Panel D shows that the crisis increased the product exit rates of incumbent exporters substantially only in the Dominican Republic and moderately in Costa Rica, Mexico, and Nicaragua.

²⁵ The average number of HS 6-digit products exported per incumbent exporter in LAC countries ranges from 5.8 in Ecuador to 8.9 in Peru, as shown in Appendix C.

Figure 5: Product Entry, Exit, and First-Year Survival Rates for Incumbent Exporters
Panel A. Entry - Averages in 2005-2007 **Panel B. Entry - Averages in 2008-2009**

Panel C. Exit - Averages in 2005-2007

Panel D. Exit - Averages in 2008-2009

Panel E. Survival - Averages in 2005-2007

Panel F. Survival - Averages in 2008-2009

Notes: in Panels A, C, and E the averages for Ecuador cover 2006-2007. Colombia does not enter in Panels A, C, and E due to lack of data. Brazil does not enter in the figure due to lack of access to the exporter-level customs data.

Panels E and F of Figure 5 show first-year survival rates for new products of incumbent exporters in each country during 2005-2007 and 2008-2009. The average survival rate in LAC during the steady growth period indicates tremendous attrition: more than 70% of the new products that incumbent exporters started to export in a given year did not remain in the market beyond that year. However, incumbent exporters in LAC natural resource countries exhibited substantially higher new product survival rates than those in comparator South Africa. Among processing countries Guatemala exhibited the highest new product survival rate. Panel F shows the global recession reducing the survival rates of new products of incumbent exporters substantially in the Dominican Republic and moderately in other LAC countries.

5.2 Exports of New Products and Contribution to Export Growth of Incumbent Exporters

To characterize further entrepreneurship along the new product dimension in the LAC region, Figure 6 shows the average size of new products relative to the average size of pre-existing (incumbent) products in terms of export value for incumbent exporters in each country during 2005-2007 and 2008-2009. Exports of new products were very small, ranging from less than 2% of incumbent products' exports in Chile and Peru to 7.3% of incumbent products' exports in Guatemala during the steady growth period. These differences may be linked to the degree of maturity and experience as an exporting country, which is much higher in Chile than in Guatemala. Panel B shows that the size of new products relative to incumbent products increased during the crisis period as an average across LAC and specifically in Chile, Costa Rica, El Salvador, Mexico, and Peru. For these countries, the global recession was actually associated with incumbent exporters starting to export new products at a relatively larger scale.

Figure 6: Relative Size of New Products' Exports for Incumbent Exporters
Panel A. Averages in 2005-2007
Panel B. Averages in 2008-2009

Notes: in Panel A the average for Ecuador covers 2006-2007. Colombia does not enter in Panel A due to lack of data. Brazil does not enter in the figure due to lack of access to the exporter-level customs data.

Finally, we examine the contribution of new products to short-run export growth of incumbent exporters in LAC and comparator countries. Figure 7 shows the average annual growth rate in total exports of incumbent exporters for each country during 2005-2007 in Panel A and 2008-2009 in Panel B. The average contribution of the three terms in the incumbent exporters' export growth decomposition in Eq. (2) -- for new, incumbent, and exiting products -- is presented for each country in Panel C for 2005-2007 and in Panel D for 2008-2009. During the steady growth period, incumbent products contributed the largest share to the growth of incumbent exporters in every LAC country. New products contributed a meaningful share to export growth of incumbent exporters only in the Dominican Republic, El Salvador, Guatemala, and Nicaragua. A potential rationale for the importance of new products in these countries relates to the entry into force of the Central America Free Trade Agreement (CAFTA) agreement with the United States whereby incumbent exporters gained access to a very large market to which they likely started exporting new products. However, note that for El Salvador, the reduction in exports due to products dropped by incumbent exporters more than compensated for the increase in exports due to their new products. Interestingly, the importance of new products in explaining export growth of incumbent exporters was smaller in LAC than in its comparators in groups of natural resource countries and processing countries.

Figure 7: Export Growth of Incumbent Exporters and its Decomposition along the Product Dimension

Notes: panels A and B and C and D show, respectively, averages across the period 2005-2007 for each country (2006-2007 for Ecuador) and 2008-2009 as described in Section 3. Colombia does not enter in Panels A, C, and E due to lack of data. For each country the sum of the numbers shown in each part of the bar in Panel C (*Panel D*) adds up to the total shown on top of the bar in Panel A (*Panel B*). For each country, the sum of the numbers shown in each part of the bar in Panel E adds up to the total shown in the new product part of the bars in Panel C.

During the global recession, the average export growth of incumbent exporters was negative in the most developed LAC countries - Chile, Colombia, Costa Rica, Colombia, Mexico, Peru - (as well as in South Africa) but was positive in the LAC processing countries (as well as its comparators) and in Ecuador. Incumbent products explained most of the export decline for incumbent exporters in Chile, Colombia, Mexico, and Peru and most of the export growth for incumbent exporters in Ecuador and Nicaragua. Interestingly, during the crisis new products became the major contributor to export growth of incumbent exporters in the Dominican Republic, El Salvador, and Guatemala and they also accounted for a large share in Nicaragua and Ecuador. The participation in the CAFTA might have partially insulated the LAC processing countries' incumbent exporters from the crisis (despite the important decline in U.S. demand) by fostering entrepreneurship through the introduction of new products. This pattern of the crisis fostering entrepreneurship was also verified in Ecuador.

Analyzing further the role of new products for export growth of incumbent exporters, Panel E of Figure 7 shows that during the steady growth period the contribution of new products was mostly accounted for by the products with higher durability in the market, i.e., those that continued to be exported by incumbent exporters in $t+1$ in all LAC countries.²⁶ This was also the case in some comparator countries though not so clearly in Bangladesh.

6. Export Entrepreneurship across LAC Countries along the New Destination Dimension

Export entrepreneurship is also present when incumbent exporters start exporting to new destinations. To examine this dimension of entrepreneurship, we focus on incumbent exporters (as defined in Table 1) in each country and consider their export destination markets.²⁷

6.1 Destination Entry, Exit and Survival Rates

Panels A and B of Figure 8 shows the destination entry rates for incumbent exporters during 2005-2007 and 2008-2009.²⁸ Incumbent exporters in LAC engaged in a high degree of experimentation along the destination dimension during the steady growth period: on average a

²⁶ The decomposition of the contribution of new products during the crisis period is not presented due to the lack of data for 2010 for most LAC countries which would be necessary to calculate the survival of new products into the year following 2009.

²⁷ Brazil, New Zealand, and Spain are not used in this section given that we do not have access to the raw exporter-level customs data for those countries necessary to compute the measures used here.

²⁸ The average number of destinations served per incumbent exporter in LAC countries ranges from 2.6 in Mexico and Nicaragua to 4.7 in Chile, as shown in Appendix C.

quarter of the destinations served by incumbents in a given year were not served in the previous year. Mexico exhibited the lowest destination entry rate by incumbent exporters while entry rates did not differ much across LAC natural resource countries and processing countries. However, among both natural resource countries and processing countries, incumbent exporters in LAC countries exhibited much lower destination entry rates than incumbent exporters in the comparator countries. Panel B reveals that the global recession did not reduce export entrepreneurship by incumbent exporters along the destination dimension in the LAC region, and in the case of the Dominican Republic it increased it substantially.

Destination exit rates for incumbent exporters in each country are presented in Panels C and D of Figure 8 for 2005-2007 and 2008-2009. During the steady growth period, 17% of the destinations served by incumbents in LAC in a given year were dropped by the following year on average. Since product exit rates were lower than entry rates, there was on average positive net entry into new destinations by incumbent exporters in LAC from 2005 to 2007. As was the case for entry rates, Mexico exhibited the lowest destination exit rate while within the groups of natural resource countries and processing countries exit rates were quite similar across LAC countries. However, among both natural resource countries and processing countries, incumbent exporters in LAC countries exhibited much lower destination exit rates than incumbent exporters in the comparator countries. Panel D reveals that the crisis did not alter destination exit rates by incumbent exporters in the LAC region with the exception of the Dominican Republic where those exit rates increased substantially.

Panels E and F of Figure 8 show the first-year survival rates for the new destinations of incumbent exporters in each country during 2005-2007 and 2008-2009. The average survival rate in LAC during the steady growth period indicated a high degree of attrition: more than 60% of the new destinations served by incumbent exporters in a given year were no longer served by the next year. Within LAC, natural resource countries exhibited slightly higher survival rates of new destinations than other countries. Among natural resource countries, incumbent exporters in LAC countries exhibited substantially higher survival rates than those of incumbent exporters in South Africa. Among processing countries, all LAC countries exhibited lower survival rates than Bangladesh but higher survival rates than Cambodia. Panel F shows that the global recession was associated with a slight reduction in first-year survival rates of new destinations of incumbent exporters across LAC countries.

Figure 8: Destination Entry, Exit, and First-Year Survival Rates for Incumbent Exporters
Panel A. Entry - Averages in 2005-2007 **Panel B. Entry - Averages in 2008-2009**

Panel C. Exit - Averages in 2005-2007

Panel D. Exit - Averages in 2008-2009

Panel E. Survival - Averages in 2005-2007

Panel F. Survival - Averages in 2008-2009

Notes: in Panels A, C, and E the averages for Ecuador cover 2006-2007. Colombia does not enter in Panels A, C, and E due to lack of data. Brazil does not enter in the figure due to lack of access to the exporter-level customs data.

6.2 Exports to New Destinations and Contribution to Export Growth of Incumbent Exporters

To characterize further entrepreneurship along the new destination dimension in the LAC region, Figure 9 shows the average size of new destinations relative to incumbent destinations in terms of export value for the incumbent exporters in each country during 2005-2007 and 2008-2009. Exports to new destinations were generally small, ranging from less than 5% of the exports to incumbent destinations in Chile to 12% of the exports to incumbent destinations in Ecuador. As in the case of exports of new products, we can only speculate that the differences between Chile and Ecuador were due to the former country's longer time under an open trade regime, which has perhaps fostered outward-oriented firms with longer exporting experience. Panel B shows that during the crisis the size of exports to new destinations by incumbent exporters relative to exports to incumbent destinations increased as an average in the LAC region and in most individual countries.

Figure 9: Relative Size of Exports to New Destinations for Incumbent Exporters
Panel A. Averages in 2005-2007 **Panel B. Averages in 2008-2009**

Notes: in Panel A the average for Ecuador covers 2006-2007. Colombia does not enter in Panel A due to lack of data. Brazil does not enter in the figure due to lack of access to the exporter-level customs data.

Finally, we examine the contribution of new destinations to short-run export growth of incumbent exporters in LAC and comparator countries. Figure 10 shows the average annual growth rate in total exports of incumbent exporters for each country in 2005-2007 in Panel A and 2008-2009 in Panel B. The average contribution of the three terms in the incumbent exporters' export growth decomposition in Eq. (3) -- for new, incumbent, and exiting destinations -- is presented for each country for 2005-2007 in Panel C and for 2008-2009 in Panel D. During the steady growth period, incumbent destinations accounted for the largest share of the growth of

incumbent exporters in every LAC country. New destinations contributed a meaningful share to export growth of incumbent exporters only in Dominican Republic, Ecuador, El Salvador, Guatemala, and Nicaragua. Given the growth rates in Panel A, this pattern suggests that new destinations contributed minimally to annual export growth in the countries whose incumbent exporters experienced fastest growth in LAC (Chile and Peru). Note that for El Salvador, Costa Rica, and Peru the reduction in exports due to destinations dropped by incumbent exporters almost compensated for the increase in exports due to their new destinations. The importance of new destinations in explaining export growth of incumbent exporters in LAC processing countries was much smaller than in Bangladesh and the same was true in the LAC countries with broad manufacturing export bases relative to Egypt.

As mentioned above in reference to Figure 7, during the global recession period, the average export growth of incumbent exporters was negative in the most developed LAC countries but was positive in the LAC processing countries and in Ecuador. Incumbent destinations accounted for most of the export decline of incumbent exporters in Chile, Colombia, and Mexico. Interestingly, new destinations played a dominant role in explaining export growth of incumbent exporters in the Dominican Republic, El Salvador, Guatemala and Nicaragua and played as much of a role as incumbent destinations in explaining export growth of incumbent exporters in Ecuador. For the LAC processing countries and Ecuador, the crisis was associated with an increase in export entrepreneurship by incumbent exporters through the exploration of new export destinations.

Examining further the role of new destinations for export growth of incumbent exporters, Panel E of Figure 10 shows that during the steady growth period, the contribution of new destinations was mostly accounted for by the more durable destinations, i.e., those that continued to be served by incumbent exporters in $t+1$ in all LAC countries.²⁹ This was also the case in other comparator countries though not in Egypt.

²⁹ The decomposition of the contribution of new destinations during the crisis period is not presented due to the lack of data for 2010 for most LAC countries which would be necessary to calculate the survival of new destinations into the year following 2009.

Figure 10: Export Growth of Incumbent Exporters and its Decomposition along the Destination Dimension

Notes: panels A and B and C and D show, respectively, averages across the period 2005-2007 for each country (2006-2007 for Ecuador) and 2008-2009 as described in Section 3. Colombia does not enter in Panels A, C, and E due to lack of data. For each country the sum of the numbers shown in each part of the bar in Panel C (*Panel D*) adds up to the total shown on top of the bar in Panel A (*Panel B*). For each country, the sum of the numbers shown in each part of the bar in Panel E adds up to the total shown in the new destinations part of the bars in Panel C.

7. Export Entrepreneurship in LAC across Types of Sectors

The patterns of export entrepreneurship in the LAC region established in the earlier Sections refer to all exporters or to incumbent exporters and their products distinguished across their novelty, but not taking any sectoral dimension into account. A sectoral dimension may be important to understand whether sectoral differences related to natural resource intensity or labor intensity shape export entrepreneurship. To this end, we construct some entrepreneurship indicators listed in Table 1 separately for each HS 2-digit sector and average them according to two sectoral typologies.³⁰ To the best of our knowledge, this paper is the first to systematically examine exporter turnover and survival by sector for a large number of developing countries.

7.1 Exporter Entry, Exit, and Survival – First Typology

The first typology of sectors is composed of four broad categories: agriculture, ores and metals, industrial, and textiles and apparel.³¹ The list of HS 2-digit codes entering each of these categories is provided in the notes of the relevant figures. Panels A and B of Figure 11 shows the exporter entry rates in each sector and country during 2005-2007 and 2008-2009. Despite the boom in commodity prices in the late 2000s, entry rates of new exporters in ores and metals sectors were not higher than entry rates in industrial sectors in LAC countries and they were not particularly higher in LAC natural resource countries relative to other LAC countries. Entry rates in agriculture were the lowest among sectors in all LAC countries, but this was also the case in comparator countries. Those entry rates were more than 20 percentage points lower than those in industrial sectors in Chile, Costa Rica, Ecuador, and El Salvador. Among natural resource countries Ecuador exhibited the highest entry rates in all sectors (except agriculture) while Cambodia exhibited much higher entry rates in all sectors than any LAC processing country. Panel B shows that with the crisis, entry rates in ores and metals sectors declined substantially in the Dominican Republic and El Salvador but increased substantially in Costa Rica. In 2008-2009, entry rates into agriculture sectors declined in several LAC countries (strongly in Ecuador) while entry rates in textiles and apparel sectors declined only slightly in LAC processing countries.

³⁰ Since the entrepreneurship indicators are recalculated for each sector separately in a given country, the average across the rates obtained for the various sectors in the country differs from the rates calculated for the country as a whole. Note also that for a given country the magnitudes of a given entrepreneurship indicator – e.g., an entry rate – will differ substantially across sectoral typologies because the numerator and denominator of that indicator will differ substantially across different groups of sectors.

³¹ The same restrictions in terms of comparators and Brazil not being shown in the figures discussed in Section 5 apply here.

Figure 11: Exporter Entry Rates by Broad Sector

Panel A. Entry - Averages in 2005-2007

Panel B. Entry - Averages in 2008-2009

Panel C. Exit - Averages in 2005-2007

Panel D. Exit - Averages in 2008-2009

Panel E. Survival - Averages in 2005-2007

Panel F. Survival - Averages in 2008-2009

Notes: in Panels A, C, and E the averages for Ecuador cover 2006-2007. Colombia does not enter in Panels A, C, and E due to lack of data. Brazil does not enter in the figure due to lack of access to the exporter-level customs data. Agriculture sectors are HS 01-24. Ores and Metals are HS 25-27 and 71-81. Industrial sectors are HS 29-49, 64-70, and 82-97. Textiles and apparel sectors are HS 50-63.

Exporter exit rates in each sector and country are presented in Panels C and D of Figure 11 for 2005-2007 and 2008-2009. During the steady growth period, exporter exit rates in ores and metals were the lowest among all sectors in all LAC countries (about 28% on average), with the exception of El Salvador and Mexico where agriculture sectors exhibited the lowest exit rates. Exit rates in either industrial sectors or textiles and apparel sectors were the highest among sectors in all LAC countries except Ecuador and Nicaragua where agriculture sectors exhibited the highest exit rates. Within LAC, Mexico exhibited the highest exit rates in all sectors (all above 40%). LAC natural resource countries exhibited lower exit rates in all sectors than South Africa, but LAC processing countries exhibited higher exit rates than Cambodia in all sectors and Bangladesh in most sectors. Panel D indicates that with the crisis, exporter exit rates in ores and metals sectors increased substantially only in the Dominican Republic and Ecuador. In 2008-2009 exit rates in industrial sectors as well as in textiles and apparel sectors increased in all LAC countries.³² Exit rates in agriculture sectors did not change much in 2008-2009 relative to previous years except in the Dominican Republic where they increased importantly.

Low entry into natural resource-based sectors is not surprising given the economies of scale and thus the high entry costs in those sectors. The boom in commodity prices in the late 2000s may have helped reduce exit in those sectors but did not bring a very large proportion of new players.

First-year survival rates of new exporters in each sector and country are shown in Panels E and F of Figure 20 for 2005-2007 and 2008-2009. Some strong patterns emerge during the steady growth period. Survival rates in the agriculture sectors were substantially higher than in all other sectors in all LAC countries except the Dominican Republic where survival rates were highest in textiles and apparel sectors. This is not a purely LAC feature since it was also verified in Bangladesh and South Africa. In most LAC countries survival rates were lowest in industrial sectors and some of the implied magnitudes are striking: more than 80% of new exporters in industrial sectors in the Dominican Republic, Ecuador, El Salvador, Nicaragua, and Peru stopped exporting in that sector after just one year. However, survival rates were only slightly higher in ores and metals sectors. Panel B shows that the global recession had little effect on first-year survival rates across sectors in all LAC countries with the exception of Ecuador where survival rates declined substantially.

³² Mexico is however an exception to the latter pattern as its exit rate in textiles sectors experienced a slight decline.

7.2 Exporter Entry, Exit, and Survival – Second Typology

As a second typology we classify sectors according to their comparative advantage in each country based on observed patterns of trade. To define comparative advantage we focus on the concept of net trade, taking exports and imports into account. Following Vollrath (1991) we computed a net-trade revealed comparative advantage index for each HS 2-digit sector and then categorized sectors into those with indexes greater than 0 - sectors with comparative advantage - and those with indexes smaller than 0 - sectors without comparative advantage.³³

Panels A and B of Figure 12 presents the exporter entry rates in sectors with and without comparative advantage in each country during 2005-2007 and 2008-2009. Despite heterogeneity in exporter entry rates across sectors and countries, a strong pattern emerges during the steady growth period: entry rates were higher in sectors that did not have revealed comparative advantage as an average in LAC and in every country except Costa Rica. This was, however, not a feature of LAC as it was also observed in Bangladesh, Cambodia, and South Africa. Ecuador and Peru exhibited the highest entry rates in the two types of sectors among natural resource countries, but Cambodia exhibited higher entry rates than any LAC processing country. Panel B shows that with the global recession average entry rates in the LAC region decreased in comparative advantage sectors but were unchanged in other sectors.

Exporter exit rates in sectors with and without comparative advantage in each country are presented in Panels C and D of Figure 12 for 2005-2007 and 2008-2009. Exit rates were systematically higher in sectors with comparative advantage in all LAC countries except Chile during the steady growth period. The differences were in some cases very large: e.g., in the Dominican Republic an 11 percentage point difference separated the exit rates in sectors with and without comparative advantage. Panel D shows that the financial crisis increased exit rates in both types of sectors and the increases were highest in the Dominican Republic.

³³ We use export flows and import flows at the HS 2-digit sector for all countries in the world in 2005 from World Integrated Trade Solution (WITS) to calculate the relative export advantage indexes (revealed comparative advantage in Balassa (1965) terminology) and similarly defined relative import advantage indexes for each HS 2-digit sector in each LAC country. The net-trade revealed comparative advantage index for a sector is computed as the logarithm of the corresponding relative export advantage index minus the logarithm of the relative import advantage index. A net-trade revealed comparative advantage index greater than 0 indicates that the country has a comparative advantage in that sector.

Figure 12: Exporter Entry, Exit, and First-Year Survival Rates by Revealed Comparative Advantage

Panel A. Entry - Averages in 2005-2007

Panel B. Entry - Averages in 2008-2009

Panel C. Exit - Averages in 2005-2007

Panel D. Exit - Averages in 2008-2009

Panel E. Survival - Averages in 2005-2007

Panel F. Survival - Averages in 2008-2009

Notes: in Panels A, C, and E the averages for Ecuador cover 2006-2007. Colombia does not enter in Panels A, C, and E due to lack of data. Brazil does not enter in the figure due to lack of access to the exporter-level customs data. The sectors with comparative advantage in each LAC country are shown in Appendix D.

Panels E and F of Figure 12 show the first-year exporter survival rates in sectors with and without comparative advantage in each country during 2005-2007 and 2008-2009. Survival rates were higher in sectors with comparative advantage in all LAC countries except Costa Rica during the steady growth period. The differences were in some cases very large: e.g., in Ecuador a 22 percentage point difference separated the survival rates in sectors with and without comparative advantage. Again this was not a LAC specific pattern, as it was verified also in Bangladesh, Cambodia, and South Africa. In absolute the magnitudes are striking: whether a sector has comparative advantage or not, more than 75% of new exporters in that sector do not make it beyond their first year. Panel F shows that the global recession did not affect exporter survival rates across sectors with and without comparative advantage in LAC countries.

These patterns suggest that exporters in the LAC region are engaging in a high degree of experimentation in ‘non-traditional’ sectors where they do not have comparative advantage. However, the longer-lasting new export relationships were observed in sectors with revealed comparative advantage, which may be linked to learning spillovers due to the presence of networks of established exporters in each country. These patterns are, however, not a feature of the LAC region per se since they are also observed in comparator countries.

8. Conclusion

Using novel exporter-level data from customs for 11 countries in the LAC region – Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, and Peru – covering the period 2005-2009, we uncover a wealth of new findings on export entrepreneurship in the LAC region.

A few of the findings are worth highlighting. First, the region appears to be no less entrepreneurial in terms of the extensive margins of exports relative to other countries, and relatedly, entry rates across sectors are quite similar but survival rates appear to be highest in agriculture sectors. Second, the size of new exporters tends to be relatively smaller (in comparison to incumbent exporters) in natural resource-abundant countries. Third, entrepreneurship is driven to some extent by comparative advantage. More specifically, although firm entry rates into exporting are higher in sectors in which countries do not have comparative advantage than in sectors with comparative advantage (in the sense of Vollrath 1991), firm exit rates as well as survival rates of new exporters are notably higher in sectors with comparative

advantage. Lastly, the global recession of 2008-2009 was associated with low or negative export growth in the more advanced Latin American economies, but most of the low growth of exports was due to declines in the rate of growth of exports of incumbent firms' pre-existing products and destinations, while new products and destinations tended to attenuate the negative effects of the crisis. Overall, it is thus safe to conclude that export entrepreneurship is not a major source of annual export growth in the short-run (although given the high rates of churning it is likely to be very important in the long-run) in Latin America and elsewhere, but entrepreneurship by incumbent exporters acts as a safety valve during periods of distress.

These findings are novel but are by no means exhaustive. In fact a series of questions open up for future research. For example, it will be of interest to examine the impediments to entry into exporting in natural resource based sectors versus footloose manufacturing sectors as well as the role of spillovers based on the presence of existing exporters in the immediate environment for entry into exporting of new products or new destinations by firms.

References

- Alvarez, R. and J. Fuentes (2011). "Entry into Export Markets and Product Quality," *The World Economy* 34: 1237-1262.
- Amiti, M. and C. Freund (2010). "An Anatomy of China's Export Growth," in R. Feenstra, S.-J. Wei (Editors) *China's Growing Role in World Trade*, The University of Chicago Press (2010).
- Bernard, A., J. Jensen, and P. Schott (2009). "Importers, Exporters and Multinationals: A Portrait of Firms in the U.S. that Trade Goods" in T. Dunne, J. Jensen and M. Roberts (eds.), *Producer Dynamics: New Evidence from Micro Data*. University of Chicago Press.
- Besedes, T. and T. Prusa (2010). "The Role of the Extensive and Intensive Margins and Export Growth," *Journal of Development Economics* 96: 371-379.
- Caves, R. (1998). "Industrial Organization and New Findings on the Turnover and Mobility of Firms," *Journal of Economic Literature* 36: 1947-1982.
- Cebeci, T., Fernandes, A., Freund, C., and M. Pierola (2012). "Exporter Dynamics Database," Policy Research Working Paper No. 6229, The World Bank.
- Eaton, J., Eslava, M., Kugler, M., and J. Tybout (2008). "Export dynamics in Colombia: Transactions Level Evidence," Borradores de Economia No. 522, Banco de la Republica, Colombia.
- Felbermayr, G. and W. Kohler (2006). "Exploring the Intensive and Extensive Margins of World Trade," *Review of World Economics* 142: 642-674.
- Freund, C. and D. Pierola (2010). "Export Entrepreneurs Evidence from Peru," Policy Research Working Paper No. 5407, The World Bank.
- Freund, C. and D. Pierola (2012). "Export Superstars," Policy Research Working Paper No. 6222, The World Bank.
- Helpman, E., Melitz, M. and Y. Rubinstein (2008) "Estimating Trade Flows: Trading Partners and Trading Volumes," *Quarterly Journal of Economics* 123: 441-487.
- Hummels, D. and P. Klenow (2005) "The Variety and Quality of a Nation's Exports," *American Economic Review* 95: 704-723.
- Lederman, D. and W. Maloney (2012). *Does What You Export Matter? In Search for Empirical Guidance for Industrial Policies*. The World Bank.
- Lederman, D., Rodriguez-Clare, A. and D. Xu (2011). "Entrepreneurship and the Extensive Margin in Export Growth: a Microeconomic Accounting of Costa Rica's Export Growth during 1997-2007," *World Bank Economic Review* 25: 543-561.
- Vollrath, T. (1991). "A Theoretical Evaluation of Alternative Trade Intensity Measures of Revealed Comparative Advantage," *Review of World Economics* 2: 265-280.

Appendix

Appendix A. Exporter Size

Appendix Table A1: Average Size of Entrants and Incumbent Exporters and Median Size of All Exporters, Entrants and Incumbent Exporters

	<i>Average Exports per Entrant (USD)</i>		<i>Average Exports per Incumbent (USD)</i>	
	2005-2007	2008-2009	2005-2007	2008-2009
Brazil	1,455,939	1,990,527	8,694,629	11,300,000
Chile	350,019	231,687	11,600,000	11,900,000
Colombia		249,212		2,653,303
Costa Rica	214,978	364,825	3,194,111	3,023,848
Dominican Republic	146,627	100,738	2,786,884	2,827,160
Ecuador	224,623	401,969	2,925,193	3,267,647
Guatemala	173,438	136,951	1,816,316	2,121,855
Mexico	469,318	618,736	9,009,084	9,779,438
Nicaragua	202,815	238,816	1,899,037	2,580,893
Peru	133,884	180,214	5,396,579	5,791,052
El Salvador	92,217	82,169	2,129,521	2,471,139
<i>LAC average</i>	<i>346,386</i>	<i>417,804</i>	<i>4,945,135</i>	<i>5,246,940</i>

	<i>Median Exports per Exporter (USD)</i>		<i>Median Exports per Entrant (USD)</i>		<i>Median Exports per Incumbent (USD)</i>	
	2005-2007	2008-2009	2005-2007	2008-2009	2005-2007	2008-2009
Brazil	205,902	236,799	37,112	40,453	336,342	388,867
Chile	49,240	57,279	9,606	11,629	176,150	182,965
Colombia		70,528		17,189		131,566
Costa Rica	59,096	60,149	10,507	11,816	188,565	118,384
Dominican Republic	26,285	30,105	8,302	8,739	90,015	86,054
Ecuador	30,469	41,326	10,480	17,000	76,506	82,812
Guatemala	39,492	38,236	7,972	6,411	89,353	92,621
Mexico	45,579	53,253	11,426	14,067	108,661	122,068
Nicaragua	30,033	42,050	9,433	12,799	68,479	92,539
Peru	34,157	47,251	10,140	14,815	88,610	106,241
El Salvador	29,262	33,168	6,273	8,467	67,026	77,338
<i>LAC average</i>	<i>54,951</i>	<i>64,558</i>	<i>12,125</i>	<i>14,853</i>	<i>128,970</i>	<i>134,678</i>

Note: the average for Ecuador in the 2005-2007 period covers 2006-2007.

Appendix B. Entrant Exporter Size with Monthly Data

We use the monthly customs export transaction data for Peru which was aggregated to provide us with the exporter-level data used in the rest of the paper to examine the effect of the month of entry into export markets on entrant exporter size. The probability of entry into export markets each month shown in Appendix Figure B1 suggests that the difference in probabilities for the second half of the year relative to the first half of the year is small. The probability of entry into export markets each month shown in Appendix Figure B1 suggests that the difference in probabilities for the second half of the year relative to the first half of the year is small. Appendix Figure B2 shows that as expected the average size of new exporters relative to the average size of incumbent exporters is larger for the exporters that enter in the first half of the year. However, and more importantly regardless of the month of entry, the average size of new exporters relative to the average size of incumbent exporters is small below 10% (an exception is verified for the period 2005-2007 where the average for month 2 is driven by a particularly large entrant).

Appendix Figure B1: Likelihood of Entry into Export Markets By Month

Appendix Figure B2: Average Exporter Entrant Size By Month of Entry

Appendix C. Products and Destinations of Incumbent Exporters

Appendix Table C1: Average Number of Products and Destinations per Incumbent Exporter

	Average Number of Products per Incumbent		Average Number of Destinations per Incumbent	
	2005-2007	2008-2009	2005-2007	2008-2009
Chile	6.0	5.8	4.7	4.7
Colombia		5.8		3.5
Costa Rica	7.1	7.3	4.1	3.9
Dominican Republic	6.0	6.6	2.9	3.1
Ecuador	5.8	5.0	3.2	3.4
Guatemala	7.8	7.6	2.9	3.1
Mexico	8.6	9.1	2.6	2.7
Nicaragua	6.8	8.7	2.6	2.7
Peru	8.9	8.7	3.5	3.5
El Salvador	8.5	8.3	2.9	3.0
<i>LAC average</i>	<i>7.3</i>	<i>7.3</i>	<i>3.3</i>	<i>3.4</i>

Note: the average for Ecuador in the 2005-2007 period covers 2006-2007.

Appendix D. Definition of Comparative Advantage

Appendix Table D1: Typology of Sectors According to Revealed Comparative Advantage

HS 2-digit Sectors with Comparative Advantage	
	01-02 ; 05-06 ; 08-09 ; 12 ; 14-18 ; 20-26 ; 36 ; 41 ; 43-44 ; 47-48 ; 50 ; 52-53 ; 61 ; 63-64 ; 68-69 ; 71-72 ; 75-76 ;
<u>Brazil</u>	<u>79-80 ; 87 ; 93-94 ; 97.</u>
	01-04 ; 06-08 ; 11-14 ; 16 ; 20-23 ; 25-26 ; 28-29 ; 31 ;
<u>Chile</u>	<u>36 ; 41 ; 44 ; 47 ; 51 ; 71 ; 74 ; 81 ; 97.</u>
	03 ; 05-06 ; 08-09 ; 11 ; 14 ; 16-18 ; 20-21 ; 24-26 ; 41-
<u>Colombia</u>	<u>43 ; 49 ; 56 ; 60-62 ; 69 ; 71-72 ; 97.</u>
	01-03 ; 05-09 ; 15-17 ; 20-21 ; 25-26 ; 40 ; 42-44 ; 61-62
<u>Costa Rica</u>	<u>; 70 ; 84-85 ; 90 ; 94.</u>
	06-09 ; 13 ; 17-18 ; 20-22 ; 24 ; 26 ; 42 ; 47 ; 61-65 ; 69 ;
<u>Dominican Rep</u>	<u>71-72 ; 83 ; 85 ; 90.</u>
<u>Ecuador</u>	03 ; 05-09 ; 14-18 ; 20 ; 24 ; 44-45 ; 53 ; 65.
	01 ; 03 ; 06 ; 09 ; 11 ; 13 ; 16-17 ; 19 ; 22 ; 26 ; 34 ; 42 ;
<u>El Salvador</u>	<u>46 ; 48 ; 53 ; 61-63 ; 68 ; 71 ; 76 ; 82.</u>
	03 ; 06-09 ; 12 ; 14-17 ; 20 ; 22 ; 24 ; 26 ; 34 ; 36 ; 40 ;
<u>Guatemala</u>	<u>42 ; 44 ; 47 ; 57 ; 61-63 ; 69 ; 71 ; 74 ; 78 ; 80.</u>
	01 ; 03 ; 07-09 ; 13-14 ; 17 ; 20 ; 22 ; 25 ; 61-63 ; 68-69 ;
<u>Mexico</u>	<u>70-71 ; 79 ; 83 ; 85 ; 87 ; 90 ; 92 ; 94-97.</u>
	01-09 ; 12 ; 17 ; 24 ; 41 ; 44 ; 47 ; 61-62 ; 69 ; 71 ; 74 ;
<u>Nicaragua</u>	<u>85 ; 97.</u>
	03 ; 06-09 ; 13-14 ; 16 ; 18 ; 20 ; 23 ; 25-26 ; 41 ; 43-44 ;
<u>Peru</u>	<u>51 ; 61-62 ; 68 ; 71 ; 74 ; 78-79 ; 80-81 ; 97.</u>