WPS7452

Policy Research Working Paper 7452

Exporter Behavior, Country Size and Stage of Development

Evidence from the Exporter Dynamics Database

Ana M. Fernandes
Caroline Freund
Martha Denisse Pierola

WORLD BANK GROUP
Development Research Group
Trade and International Integration Team
October 2015

Policy Research Working Paper 7452

Abstract

This paper presents new data on the micro structure of the export sector for 45 countries and studies how exporter behavior varies with country size and stage of development. Larger countries and more developed countries have more exporters, larger exporters, and a greater share of exports controlled by the top 5 percent. The extensive margin (more firms) plays a greater role than the intensive margin (average size) in supporting exports of larger countries. In contrast, the intensive margin is relatively more important in explaining the exports of richer countries. Exporter entry and exit rates are higher and entrant survival is lower at an early stage of development. The paper discusses the results in light of trade theories with heterogeneous firms and the empirical literature on resource allocation, firm size, and development. An implication from the findings is that developing countries export less because the top of the firm-size distribution is truncated.

This paper is a product of the Trade and International Integration Team, 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, CFreund@PIIE.COM, and mpierola@worldbank.org.

Exporter Behavior, Country Size and Stage of Development: Evidence from the Exporter Dynamics Database*

Ana M. Fernandes **Caroline Freund** **Martha Denisse Pierola**

JEL Classification codes: F14, O1.

Keywords: exporter dynamics, exporter growth, firm-level data, allocative efficiency.

* Ana Fernandes and Martha Denisse Pierola are at the World Bank; Caroline Freund is at the Peterson Institute for International Economics and CEPR. The authors would like to thank two anonymous referees as well as Nathan Nunn. We are grateful to Tolga Cebeci for his collaboration on an earlier version of this paper that focuses on describing the Exporter Dynamics Database in more detail. Research for this paper has been supported in part by the World Bank's Multidonor Trust Fund for Trade and Development and through the Strategic Research Partnership on Economic Development. We also acknowledge the generous financial support from the World Bank research support budget and the Knowledge for Change Program (KCP), a trust funded partnership in support of research and data collection on poverty reduction and sustainable development housed in the office of the Chief Economist of the World Bank (www.worldbank.org/kcp). We thank Erhan Artuc, Richard Baldwin, Peter Klenow, Aaditya Mattoo, Sam Kortum, and Andres Rodriguez-Clare for many useful comments and discussions. We thank workshop participants at the Empirical Investigations in International Trade at Santa Cruz, the Graduate Institute in Geneva, the World Bank, the World Trade Organization, the International Trade Center, and Nova School of Business and Economics for useful suggestions. We thank Mario Gutierrez-Rocha, Jamal Haidar, Alberto Behar and Madina Kukenova for their contribution to this project and Francis Aidoo, Paul Brenton, Maurizio Bussolo, Huot Chea, Julian Clarke, Alain D'Hoore, Pablo Fajnzylber, Elisa Gamberoni, Sidiki Guindo, Javier Illescas, Mehar Khan, Sanjay Kathuria, Josaphat Kweka, Erjon Luci, Mariem Malouche, Eric Manes, Yira Mascaro, Mamadou Ndione, Zeinab Partow, Stefano Paternostro, Jorge Rachid, Richard Record, Jose Guilherme Reis, Jose Daniel Reyes, Nadeem Rizwan, Liviu Stirbat, Dimitri Stoelinga, Daria Taglioni, Maria Nicolas, Erik von Uexkull, Cristian Ugarte, and Ravindra Yatawara for facilitating the access to the data for developing countries. We thank Lina Ahlin, Martin Andersson, Juan de Lucio, Emmanuel Dhyne, Luc Dresse, Cédric Duprez, Richard Fabling, Jaan Masso, Raul Minguez, Asier Minondo, Andreas Moxnes, Francisco Requena, Lynda Sanderson, Joana Silva, Priit Vahter, and Hylke Vandenbussche for providing us with measures for developed countries.

1. Introduction

Exporter characteristics and dynamics vary significantly across countries. The average Chilean exporter is almost three times as large as the average Moroccan exporter, and Chile has one-third more exporters than Morocco. There are twice as many exporters in Bulgaria as in Bangladesh, but a Bulgarian firm exports on average half as much as a Bangladeshi firm. There is also wide variation in exporter dynamics across countries. Firms from Cameroon and Malawi have high entry rates into exporting but only 25 percent of entrants survive after the first year. In contrast, firms from Brazil and South Africa have lower entry rates, but among entrants, about half survive for more than one year. This paper shows that these measures of exporter behavior vary in systematic ways with country size and stage of development and considers potential explanations.

Our first goal is to introduce the Exporter Dynamics Database and use it to characterize export behavior at the firm level across countries. We use exporter-level customs information from 38 developing and 7 developed countries as input to build the *"Exporter Dynamics Database"* (henceforth referred to as the Database). The Database contains the number of exporters, average size of an exporter, exporter concentration, rates of entry and exit and entrant survival among exporters for each country at various levels of disaggregation. Using these measures, we examine how exporter behavior varies with country size and stage of development. Many previous studies use data from individual countries or a small group of countries in a region to study how firms export.[1] However, their focus has been on the size distribution of exporters and the process of resource reallocation in response to changes in trade costs within a country. In the absence of

[1] See Eaton, Kortum, and Kramarz (2008) for France; Eaton et al. (2008) for Colombia; Amador and Opromolla (2013) for Portugal; Iacovone and Javorcik (2010) for Mexico; Andersson, Lööf, and Johansson (2008) for Sweden, Albornoz et al. (2012) for Argentina; Freund and Pierola (2010) for Peru; Manova and Zhang (2012) for China, Masso and Vahter (20151) for Estonia, De Lucio et al. (2011) for Spain, Ekholm, Moxnes, and Ulltveit-Moe (2012) for Norway, Fabling and Sanderson (2012) for New Zealand, Mayer and Ottaviano (2008) for several EU countries, among others. See also Bernard et al. (2007, 2012) for the U.S. and a review of the empirical literature, respectively.

cross-country variation, such studies were unable to examine how exporter behavior changes as countries get larger or richer. We seek to fill this gap in the literature.

Our second goal is to examine predictions from trade theory with heterogeneous firms and models with allocative inefficiencies for consistency with the new evidence on exporter behavior across countries. Systematic variation in export-sector characteristics across countries of different sizes or income levels could be a result of differences in resource endowments or the process of resource allocation, among other factors. To explore how differences in resource endowments affect exporter behavior, we stick to the most basic model, the standard heterogeneous firm trade model of Melitz (2003). The model draws a direct link between firm size and inherent productivity, so the biggest firm will always also be the most productive. A stark prediction comes out of this model: larger countries should export more because they have more firms (the extensive margin), as opposed to larger firms (the intensive margin). This theory has little to say about stage of development or firm dynamics.

To explore how variation in allocative efficiency across countries affects exporter behavior, we turn to the growing literature on efficiency gains from within-sector resource reallocation across firms. These studies attribute variation in firm size not only to inherent productivity differences (like Melitz 2003) but also allow a broad set of distortions to resource allocation between firms to affect the size distribution.[2] In support, empirical studies of developing countries find a relatively wide variation in firm performance and weak correlations between size and productivity within narrowly defined sectors in a country, suggesting that misallocation of resources between firms is indeed a major impediment to growth.[3] An implication from this

[2] The distortions can be associated with several types of institutions and policies, such as labor market regulations, regulations on business entry, access to finance, taxation etc.

[3] Syverson (2004) finds that a U.S. firm in the 90th percentile in a four-digit SIC industry (443 industries) is on average twice as productive as a firm at the 10th percentile in the same industry. In developing countries, productivity differences tend to be even

literature is that countries with fewer distortions (more developed countries) should have more exporters and higher survival rates of entrants because the most productive firms have the opportunity to grow, begin exporting and expand into foreign markets. But importantly, the implications for average exporter size and exporter concentration at the top of the distribution depend on which firms are most constrained. If only the most productive firms are able to overcome regulatory hurdles in economies with allocative inefficiencies and mid-productivity firms are held back—the so-called "missing middle" of the size distribution—then exporters should be relatively larger in developing countries and very concentrated at the top of the distribution (Tybout 2000, 2014 and Alfaro, Charlton, and Kanczuk 2009). In contrast, if the high-productivity firms are the most constrained and fail to invest (Hsieh and Klenow 2009, Hsieh and Olken 2014, and Bento and Restuccia 2014), then exporters should be relatively small in more distorted economies with less concentration at the top of the distribution, which we refer to as the "truncated top" of the size distribution.

We examine whether the evidence from the Database is consistent with these predictions. We find that export-sector characteristics are correlated with both country size and stage of development in a systematic way. In particular, larger economies and more developed economies have a greater number of exporters, a larger average exporter size, and a greater concentration of exports in the top 5 percent of exporting firms. The extensive margin (more firms) explains about two-thirds of the increase in exports of larger countries, while the intensive margin (larger firms) explains the remaining third. In contrast, the intensive margin is relatively more important as an explanation for why richer countries export more. These results are robust to different levels of

larger with Hsieh and Klenow (2009) finding a ratio for the 90:10 percentile of 5:1 for China. Bartelsman et. al (2013) estimate the covariance between productivity and size in narrowly defined industries, in a group European countries and the US. They find the covariance between size and productivity was near zero (or negative) at transition in Eastern Europe and has since increased, i.e. allocative efficiency has improved sharply.

aggregation of the data, to controls for various types of fixed effects, to the prevalence of zeros in trade, and to proxies for the different importance of trade intermediaries across sectors.

The results on exporter dynamics reveal a robust and significant relationship with stage of development but not country size. We find that gross rates of entry into and exit from exporting are decreasing in stage of development, but net entry is unrelated to stage of development. There is also evidence that survival rates of entrants into export markets increase as countries develop. These results are robust to different levels of aggregation of the data and to controls for various types of fixed effects.

These stylized facts imply that as countries develop and exports grow, the export expansion happens through both the extensive and the intensive margins, and more resources flow to the largest firms. Consistent with the standard model of trade with heterogeneous firms, we find a relatively large role for the extensive margin in explaining why larger countries export larger volumes. Consistent with resource allocation improving with stage of development, we find that more developed countries have both more exporters and more resilient exporters. Overall, the positive correlations between average exporter size and stage of development and between concentration of exports at the top of the size distribution and stage of development are consistent with models where firm growth is constrained in developing countries, especially among the high-productivity firms, the "truncated top".

The rest of the paper is structured as follows. Section 2 describes briefly the Database and the variability in outcomes across countries. Section 3 discusses how the theory can help understand this variability across countries. Section 4 presents the new stylized facts on the relationship between export-sector characteristics and dynamics on the one hand, and country size and stage of development on the other hand. Section 5 discusses the results in light of trade theory

and allocative efficiency and examines how exporter behavior changes with export growth over time for robustness. Finally, Section 6 concludes.

2. The Exporter Dynamics Database

The Exporter Dynamics Database contains aggregated measures on export-sector characteristics and dynamics presented at the following levels: a) country-year, b) country-product (HS 2-digit, HS 4-digit, or HS 6-digit)-year and c) country-destination-year, and d) country-HS 2-digit product-destination-year (for a restricted sample of countries). The data are primarily for the period between 2003 and 2010. The measures are constructed using exporter-level customs data as input, covering the universe of annual exporter transactions for 38 developing countries and 7 developed countries.[4] The measures at the country-sector-destination-year level are available for 34 developing countries for which we have access to the raw exporter-level data and for 3 developed countries.[5]

The Database includes measures on the basic characteristics of the export sector in each country (e.g., number of exporters, average exporter size and exporter growth rates); concentration/diversification (e.g., Herfindahl index, share of top exporters, number of products and destinations per exporter); firm, product and market dynamics (e.g., entry, exit, first-year and

[4] The stylized facts presented in this paper use only the aggregated measures contained in the Database. The exporter-level customs datasets used as inputs to construct the Database are described to explain how the measures in the Database were built, but are not utilized in this paper for any other purpose. These exporter-level datasets are available upon request for a selected group of countries, determined by the willingness to share data by the data providers. Given the confidential nature of the exporter-level (firm-level) data used as input, we structured the Database to provide as much detail as possible on the underlying exporter structure behind an export flow, without revealing any information that could be traceable to an individual firm, as per what we agreed with all of our data providers. While the data underrepresent industrial countries and Asia, the patterns we find are robust and available statistics from other studies, such as for the US and the EU, are consistent with the patterns observed here. We aim over time to expand coverage of the Database.

[5] Table 1 marks with an asterisk the developing countries for which we have access to the raw exporter-level data. The measures at the country-year-HS2-digit product-destination level are currently only available upon request to the authors. They will be made publicly available with the second release of the expanded Database. Measures at the country-year-HS2-digit product-destination level for Norway, Portugal, and Spain were made available to the authors by Andreas Moxnes, Joana Silva, Asier Minondo and Francisco Requena, the researchers working with data for those countries.

second-year survival rates of entrants); and unit prices (e.g., per exporter of a given product). The Database is publicly available at http://data.worldbank.org/data-catalog/exporter-dynamics-database. Details on how the countries' customs data were cleaned and harmonized and how the Database was constructed are provided in Appendix 1. Further details on all the measures in the Database for each type of aggregation level are provided in Cebeci, Fernandes, Freund, and Pierola (2012).[6]

Table 1 presents a summary of the measures used in this paper, reporting averages per country for the period 2006-2008, which is the period most commonly covered across countries and captures trade performance before the global financial crisis that started at the end of 2008.[7]

Some interesting cross-country patterns emerge from Table 1. First, there is tremendous variation across countries in the number of exporters and the average exports per firm. Among developing countries, the largest numbers of exporters are found in Turkey and Mexico whereas the smallest pools of exporters are found in Niger and Mali. This pattern seems to mirror the countries' size and level of development, and these links are studied further in Section 4. The number of exporters per 1000 inhabitants is also the largest in the more developed countries in the sample. Average exports per firm are the highest for Belgium, followed by Brazil, Chile, and Mexico and the lowest in Albania, Lebanon, Macedonia, Yemen, and Kenya. The tremendous difference between mean and median exports per firm reflects the highly skewed exporter size distributions in all countries with some very large exporters driving total exports.[8] For most

[6] Due to confidentiality concerns, the Database does not provide information on the exporter size measures for cells at country-year-HS 2-digit, country-year-destination, or country-year-HS 2-digit-destination level that include a single exporter.
[7] A sharp drop in world trade as a result of the global financial crisis occurs in 2009. For countries for which data is available for only 1 or 2 years within the period 2006-2008 we compute the average based on those years. For Kuwait and Portugal the data coverage does not include that period. Hence we use averages for the 2009-2010 period for Kuwait and averages for the 2003-2005 period for Portugal in Table 1.
[8] In related work, Freund and Pierola (2015) use the cross-country exporter-level data and show that exports are dominated by a small group of very large exporters (so-called 'export superstars') considered as the top exporter or the top 5 exporters, who account for on average 15 and 30 percent of exports, respectively. Their focus is on how this group of large firms defines the sectoral pattern of exports. Focusing on data at the country-industry or product level, Easterly and Reshef (2014) show that both African and non-

developing countries concentration is smaller than for the developed countries in the sample, such as Norway, Sweden, and New Zealand. Similarly, Bernard, Jensen, and Schott (2009) and Mayer and Ottaviano (2008) show that the United States (U.S.) and other European countries exhibit high concentration in the top firms.

The measures of exporter dynamics also exhibit important variability across countries. Entry rates–defined as the number of exporters in year *t* not present in year *t-1*, over the total number of exporters in year *t*—range from 22 percent in Brazil to more than 50 percent in Malawi, Yemen, the Lao People's Democratic Republic and Tanzania. Exit rates–defined as the number of exporters in year *t-1* not present in year *t*, over the total number of exporters in year *t-1*—range from 22 percent in Bangladesh to 61 percent in Malawi.[9] First-year survival rates of entrants–defined as the number of exporters in year *t* and *t+1* not present in year *t-1*, over the total number of exporters in year *t*—vary between 23 percent in Cameroon and 61 percent in Bangladesh. The magnitude of the survival rates in Table 1 suggests an extremely high attrition rate of new entrants after just one year in export markets, particularly in Africa.

Table 2 presents the same set of measures but for groups of HS 2-digit products – henceforth designated as sectors - where the measures for each group of sectors are obtained as averages across all countries that export that particular sector, again focusing on the period 2006-2008. Table 2 shows a less pronounced variation in the number of exporters across sectors though

African countries exhibit very fat-tailed distributions of export value across products where export big hits are uncommon but are much more common than would be expected in a normal distribution whereas Hanson, Lind, and Muendler (2014) document a strong empirical regularity across countries in their patterns of comparative advantage which is hyper-specialization in exporting, the fact that in any given year, exports in the typical country tend to be highly concentrated in a small number of industries.

[9] These rates of entry into and exit from export markets are substantially larger than the rates of entry into and exit from manufacturing activity reported by Bartelsman, Haltiwanger, and Scarpetta (2013). Focusing on census/registries of manufacturing firms (excluding 1-employee businesses) they document turnover of 10-20 percent in industrial countries and somewhat higher in developing countries.

some important sectoral differences in other measures remain. The significance of these differences will be accounted for in Section 4.

3. Characteristics and Dynamics of the Export Sector: What Theory Predicts on Their Relationship with Country Size and Stage of Development

In this section, we explore the predictions about how export-sector characteristics and dynamics are likely to vary with country size and stage of development. We draw on the growing theoretical trade literature on heterogeneous firms and recent empirical evidence on how the allocation of resources differs across countries.

3.1 Export-Sector Characteristics

The standard heterogeneous firm model of trade (Melitz 2003) assumes firms are differentiated by the variety they produce and by their productivity, and that there is a fixed entry cost into exporting. A firm will enter the export market if its net export profits cover the fixed exporting cost. Because of the entry costs, there is a cutoff productivity level, such that firms at or above it will export while those below it will produce only for the domestic market. Thus, firms that export are more productive than firms that produce only for the domestic market, and export quantity is increasing in productivity. The basic model assumes a common productivity distribution across countries and a continuum of atomistic firms. This implies that greater exports of larger countries should be driven by a greater number of exporting firms, the extensive margin, and not by larger firms. The standard heterogeneous firm model of trade has little to say about stage of development.

We use recent empirical literature on allocative efficiency between firms to inform us about how stage of development and export-sector characteristics relate. This literature suggests that

countries with fewer distortions (richer countries) should have more exporters but the implications for average exporter size and concentration at the top of the size distribution vary, depending on which firms are more constrained. If taxes and regulations (e.g., on the labor market and on business entry) become heavy as firms grow larger, only the most productive can overcome these costs and there would be a "missing middle": many small firms and a few large firms but few medium-sized firms. Consistent with a "missing middle", Tybout (2000) shows a U-shaped firm-size histogram for a number of developing countries, when firms are allocated to relatively wide size bins.[10] Tybout (2014) shows that the "missing middle" does not necessarily imply a bimodal firm-size distribution. Assuming that the undistorted firm-size distribution should be an exact Pareto distribution, he compares the actual distribution with an estimated country-specific Pareto distribution. Using data for a number of Asian countries, the U.S., and Mexico, he finds that the actual firm-size distribution is wider than the estimated Pareto distribution, as represented in Panel A of Figure 1, particularly in developing countries. His results, however, are dependent on allowing the Pareto dispersion parameter to vary across countries, and he estimates a lower Pareto index (a more skewed firm-size distribution) in higher-income countries. In related work, Alfaro et al. (2009) use Dun and Bradstreet's WorldBase data for 79 countries and find that establishment size is decreasing in GDP per capita, and interpret this as being consistent with too few medium-sized firms in lower-income countries.[11]

In contrast, Hsieh and Klenow (2009) calculate a hypothetical efficient firm-size distribution, assuming the marginal products of capital and labor are equalized across all firms in

[10]Tybout shows a large spike in the firm-size distribution for the 1-4 workers size bin and a quick drop-off in the 10-49 workers size bin in poor countries.

[11] An important caveat about their data, as argued by Bento and Restuccia (2014), is that they cover listed firms so small firms are not covered and they have less complete coverage of medium-sized firms in lower-income countries. Therefore, their measure of average firm size is likely to be over-estimated for lower-income countries and this can help explain the negative correlation they find between average firm size and GDP per capita.

an industry and compare it to the actual firm-size distribution. They find that in China, India, and the U.S. the efficient firm-size distributions were more dispersed than the actual distributions. Panel B of Figure 1 illustrates their general finding. In contrast to the work of Tybout (2014), there are not enough very large or very small firms. They also find that the distortion is larger for the developing countries: the observed U.S. firm-size distribution is closer to the hypothetical efficient firm-size distribution than either the observed Indian or Chinese firm-size distribution. Hsieh and Olken (2014), using data from India, Indonesia and Mexico, find that the fraction of "missing" firms is increasing in firm size. There are more missing large firms than missing medium-sized firms, and this helps explain why less developed countries have lower income. Bento and Restuccia (2014) use comparable firm-census data for 124 countries with size measured by employment and show that the average firm size is increasing in level of development. They develop a model to explain this fact, using distortions correlated with productivity to produce too little investment, especially among firms that should grow large and such distortions can explain productivity differentials between higher- and lower-income countries. This body of research points to a "truncated top" of the firm-size distribution.

A wealth of research shows that small firms do not export because of high fixed entry costs.[12] In Figure 1, it is therefore only the right half of the firm-size distribution that is relevant for exporters. A "missing middle" in less efficient (less developed) economies would suggest that exporters are on average relatively large and their size distribution is more concentrated at the top. A "truncated top", with firms missing at the top of the size distribution in less efficient economies,

[12] See Bernard, Jensen, Redding and Schott (2007) for a summary of the literature.

would imply that exporters are on average smaller and the concentration in the top 5 percent of firms is lower.[13]

Hypothesis on export-sector characteristics: The standard heterogeneous firm trade model implies that larger countries should export more primarily through the extensive margin. Allocative efficiency implies that less developed countries have fewer exporters. If distortions in less developed countries hinder large firms from growing relatively more, a "truncated top" (Hsieh and Klenow 2009, Hsieh and Olken 2014, and Bento and Restuccia 2014), then less developed countries will have smaller exporters on average and lower export concentration at the top. If distortions primarily limit medium-sized firms from growing, a "missing middle", then the reverse is true (Tybout 2000, 2014 and Alfaro et al. 2009).

3.2 Exporter Dynamics

Allocative efficiency has important implications for exporter dynamics. In a less distorted environment, where the most productive firms grow most rapidly, the survival rates of new exporters should be relatively high. In contrast, in an economy where regulatory burdens and distortions in access to finance or information uncertainties allow less productive firms to grow, survival rates of entrants in competitive foreign markets will be relatively low. Along these lines, Araujo, Mion, and Ornelas (2012) integrate work on institutions and heterogeneous firm models

[13] Ideally, to explore the importance of allocative efficiency in explaining the differences in firm-size distributions across countries, we would like to correlate productivity with size as the previous literature has done. Unfortunately, our data do not allow us to measure productivity directly. But exporting itself is a measure of successful firm performance. Studies of developing and developed economies show that exporters are relatively more productive than firms that serve only the domestic market and that the most productive firms are the largest exporters (See Wagner 2012 for a recent review of these studies). This implies that we can glean information about the allocation of resources in an economy from the exporter-size distribution.

of trade, and predict greater exporter survival rates in countries with better institutions (which tend to be at a higher stage of development), where uncertainty is lower.

Allocative efficiency's implications for exporter entry depend on what type of distortions tend to block efficient firms from expanding and/or allow inefficient firms to remain in the export market. Entry should be lower in developing countries if the sunk costs associated with entering foreign markets (such as bureaucratic hurdles, wait times at customs, and corruption) are exceptionally high. However, uncertainty about export success at the firm level will enhance entry and exit, all else equal. With idiosyncratic uncertainty, several models of exporter dynamics show that some firms will enter the export market only to immediately exit (Albornoz et al. 2012, Segura-Cayuela and Vilarrubio 2008 and Freund and Pierola 2010). The intuition is that if export profitability is uncertain at the firm level then firms may enter foreign markets to learn their potential. Since a firm can exit, there is a one-period loss if the firm gets a poor draw, but there is a stream of future profits if the firm gets a good draw. For a given entry cost, the greater the uncertainty, the higher the "option value of entry" will be—implying more exporter entry and exit.[14]

Hypothesis on exporter dynamics: Allocative efficiency implies that entrant survival rates should be higher in more developed countries. If uncertainty is the critical distortion affecting export decisions in less developed countries, then there should be relatively higher exporter entry and exit. If sunk entry costs are higher in less developed countries and matter more than uncertainty

[14] Another type of distortion that affects allocative efficiency in a similar way is uncertainty about match quality in a search model of trade. For example, Rauch and Watson (2003) show that with imperfect information about the ability of a developing country exporter to supply a large order, developed country buyers may have more small trials before investing in an exporter for a long-term trade relationship. This would lead to more entry and exit by developing country exporters, as importers test them out. Again, there is a lot of trial and error with less information (more uncertainty) in developing countries, and a less efficient process of resource allocation.

for export decisions, then there should be relatively less exporter entry (and exit consequently). The models make no predictions about exporter dynamics and country size.

One remark in order at this point is that, although we focus on differences in resource endowments and resource allocation across countries, we are aware that other factors may be at work. For example, differences in the underlying productivity distribution of firms or in market access across countries may also help to explain our stylized facts. In our empirical work, we control for potential variation in productivity distributions across sectors, or any other differences that may affect the size distribution of firms across sectors, by focusing on exports within a sector; and, similarly, for market access by focusing on exports within a destination or sector-destination, as well as controlling for distance and other bilateral trade costs. Still, to the extent the underlying productivity distribution varies across countries within a sector-destination, this would influence our results. We discuss this possibility in more detail in Section 5.

4. Characteristics and Dynamics of the Export Sector: What the Database Shows on Their Relationship with Country Size and Stage of Development

In this section, we evaluate the empirical evidence from the Database on how export-sector characteristics and dynamics vary with country size and stage of development. We first show the importance of both country and sector characteristics in explaining exporter behavior. We then present two stylized facts on how export-sector characteristics and dynamics change as countries get larger or richer, controlling for sectoral variation in exports and variation across destinations, as well as sector-destination variation.

We begin by evaluating the relative importance of country fixed effects and either HS2-digit sector fixed effects or destination fixed effects in explaining export-sector characteristics and dynamics. Specifically, we perform an ANOVA with country and sector fixed effects, and separately with country and destination fixed effects.[15]

Panel A of Table 3 shows the results of the ANOVA with country and sector fixed effects. On average, country and sector effects explain about 60 percent of the variation in export-sector characteristics, though somewhat less of the variation in exporter dynamics.[16] With the exception of average exporter size and entrant survival, country effects explain a greater share of the variation than sector effects. Still, the significance of sector effects implies that it will be important to control for them as we examine the relationships between country characteristics and export-sector characteristics.

We next repeat the ANOVA exercise using country-destination level data. The results, reported in Panel B of Table 3, show that country and destination fixed effects together explain somewhat less of the variation in export-sector characteristics than country and sector fixed effects. However, with the exception of number of exporters, destination effects prevail over country effects. In that sense, it will be important to control for destinations to ensure the results are not being driven by variation in trade barriers or other destination-specific market access costs.

We now examine the hypotheses discussed in the previous section and present stylized facts, first focusing on basic characteristics of the export sector and then on exporter dynamics. In the analysis below, we use data from the World Development Indicators (WDI) of the World Bank

[15] The ANOVA analysis focuses on the measures' averages in 2006-2008 for simplicity. The sample used for concentration (fourth column) is relatively smaller because the share of exports accounted for by the top 5 percent of exporting firms can be calculated only if a country-sector-year cell includes more than 20 exporters. This remark applies naturally to all specifications in the rest of the section whose dependent variable is exporter concentration.

[16] The percentages accounted for by country, sector, and residual effects in Panel A or country, destination, and residual effects in Panel B do not add up to 100 percent due to the unbalanced nature of each of the cross-sectional datasets. Specifically, in Panel A not all sectors are exported by all countries while in Panel B not all destinations are served by all countries.

on GDP and on GDP per capita in constant 2005 Purchasing Power Parity (PPP) USD.[17] We also use data on determinants of bilateral trade – distance, contiguity, common language and common colonizer - from CEPII described in Mayer and Zignago (2011).

4.1 Export-Sector Characteristics and Country Characteristics

Figure 2 presents a scatter plot of the number of exporters, average exporter size, and concentration against both income and income per capita, using country-year level data averaged for the period 2006-2008.[18] The figure shows that larger as well as more developed economies have a larger number of exporters and larger average size of exporters, and richer countries have greater concentration at the top of the firm-size distribution.

Using the yearly data from 2004 to 2008, we next explore these relationships in more detail, controlling for sectoral variation in exports, variation within destinations, and sector-destination variation, in addition to controlling for year fixed effects in all specifications. The standard errors reported in all tables are clustered by country (the most conservative type of clustering possible).[19]

Table 4 reports the results from regressing log total exports, log number of exporters, log average exporter size, and share of exports accounted for by the top 5 percent of firms on log GDP per capita and log GDP. Columns (1)-(4) report the results using the country-sector-year level data for years 2004 to 2008 and controlling for year and sector fixed effects. Accounting for sector fixed effects is key as some sectors exhibit much larger average exporter sizes than others, for example due to their higher capital intensity or degree of returns to scale, as shown by the

[17] Results presented in Tables 4-7 and Appendix Tables A2.1-A2.2 are robust to the use of GDP and GDP per capita in current USD or in constant USD.

[18] For simplicity, all figures present relationships based on data averaged for the period 2006-2008 instead of being based on all years of data but the patterns are the same whether averages or all years of data are used.

[19] Our results are, however, robust to clustering standard errors by sector for the country-sector-year data, by destination for the country-destination-year data, and by sector-destination for the country-sector-destination-year data.

importance of sector effects in the ANOVA (Table 3).[20] The results indicate that, within sectors, larger countries and richer countries have more exporters, larger-sized exporters (on average), as well as higher concentration in the top 5 percent of firms.[21] The economic magnitude of these effects is such that if GDP per capita increased from the value for the country in the 25th percentile (Cameroon) to the value for the country in the 75th percentile (Lebanon) the number of exporters would increase by 80 percent, average exports per firm would increase by 71 percent, and the share of the top 5% exporters would increase by 8 percentage points.[22]

Columns (5)-(8) in Table 4 use the country-destination-year level data for years 2004 to 2008 and results are qualitatively similar. In addition to destination fixed effects these specifications control for traditional determinants of bilateral trade in gravity equations: distance, contiguity, common language, and common colonizer. The estimates show that controlling for year and market-specific characteristics, such as trade costs, more developed countries and larger countries have more exporters that on average export larger volumes and have higher export concentration at the top of the size distribution.[23]

[20] The results remain similar if we use country-HS 4-digit-year level data and control for 4-digit sector fixed effects.

[21] Total exports are equal to the product between the number of exporters and average exporter size. Since our regressions use the log of each of those variables as dependent variable and are estimated linearly, the coefficient on GDP (or GDP per capita) in the total exports regression is exactly equal to the sum of the coefficients on GDP (or GDP per capita) in the number of exporters regression and in the average exporter size regression, provided that the samples used in the three regressions are similar. Therefore in Tables 4, 5, 6 and Appendix Table A2.2 we restrict the sample in the number of exporters' regression to be the same as that used in the total exports or average exporter size regressions, that is, it excludes observations with the number of exporters equal to 1. However, note that in unreported results where we estimate number of exporter regressions including those observations the effects of GDP per capita and GDP are stronger in magnitude and significance that those shown.

[22] These magnitudes are obtained as the product of the difference in logs GDP per capita, 1.704, and the corresponding coefficient in columns (2)-(4) of Table 4: 0.471, 0.419, and 0.047.

[23] As robustness check to the result on average exporter size, in Appendix Table A2.1, we re-estimate the specifications for average exporter size using data on incumbent exporters only, in order to exclude possible biases due to the use of "partial year" data as discussed in Bernard et al. (2013). In their analysis, they show that the entry and exit of firms into and from export markets at different points in a calendar year means that the use of calendar annual data on export values to measure the average size of exporter entrants or exiters may introduce a bias - mainly their size being under-estimated during the first year - which they refer to as "partial year" effects. Our consideration of the average size of incumbent exporters addresses this concern to the extent that bias should not permeate the calculation of average size for exporters that have not interrupted their exporting activity. We find that the results from Table 4 remain qualitatively similar under this alternative sample.

Note that the coefficients in columns (1)-(3) as well as columns (5)-(7) imply that the number of exporters, the extensive margin, explains about two-thirds of the variation in total exports across countries of different size, and about 60 percent of the variation in total exports as a result of stage of development.

Columns (9)-(12) in Table 4 present results using the country-sector-destination-year level data for years 2004 to 2008 for the sample of 34 developing countries and 3 developed countries.[24] This allows us to control for interacted sector-destination fixed effects in the same regression (as well as for bilateral gravity determinants), but has the disadvantage of less variation in terms of stage of development, with only 3 developed countries included. The results confirm that within a given sector-destination, larger countries and richer countries have more exporters, larger exporters, and a greater share of exports controlled by top 5 percent of exporters. Moreover, the findings are maintained in specifications that include more stringent sector-destination-year fixed effects to account for the possibility of temporal shifts affecting sectors and destination markets and influencing exporter behavior due to trade networks and relationships, as seen in Appendix Table A2.2 (Panel A). Of interest, in the country-sector-destination regressions, the contribution of the intensive margin rises when we control for sector and destination, especially with respect to GDP per capita: the intensive margin now accounts for more than half of the variation in exports with GDP per capita.

It is worth noting that the coefficients on trade costs shown in columns (5)-(12) of Table 4 indicate that they have opposite effects on export-sector characteristics, relative to country size and stage of development. Higher trade costs (proxied by higher distance, absence of either

[24] As noted above, we do not have the raw exporter-level customs data for all the rich countries to be able to calculate the corresponding measures to estimate these regressions for all countries. We obtained the measures at the country-sector-year level for three of the rich countries, Norway, Portugal, and Spain which are used in the regressions.

common language or border) reduce exports through both the extensive and intensive margins and lead to lower exporter concentration. These results are similar to results obtained using data on U.S. exports (Lawless 2010).

One potential concern about the average exporter size results is that they may pick up the activity of intermediaries, individual firms that intermediate trade for many producers. An intermediary will be observed in our data as a single firm, but it actually consolidates exports for many firms, and there is no way to distinguish these firms from direct exporters. Ahn, Khandelwal, and Wei (2011) offer evidence on the importance of these firms in trade. They find that a significant share of exports in China went through intermediaries in the early 2000s. However, they also find that as trade expands, the importance of intermediaries declines—their share fell from 35 to 22 percent between 2000 and 2005 as China's exports surged. In part, this is because as firms expand their exports they switch from exporting through intermediaries to direct exporting. This suggests that the average exporter size variable is more likely to overstate actual exporter size and the number of exporters is more likely to understate exporter count in the less developed or small countries as compared with richer or larger countries. To examine explicitly the importance of intermediaries we estimate specifications where GDP per capita and GDP enter by themselves and interacted with a dummy variable identifying sectors with a larger presence of export intermediaries.[25] The corresponding estimates shown in Table 5 reveal significantly larger numbers of exporters, larger average exporter size and higher concentration in richer countries and in larger countries as in Table 4.[26] In sectors with more intermediaries, the overall effect of income

[25] We follow Chan (2014)'s choice of sectors with a larger proportion of firms exporting indirectly according to World Bank Enterprise Surveys data for 118 countries as those with a higher prevalence of export intermediaries.

[26] The coefficient on GDP per capita in the share of the top 5% of exporters regression in column (8) of Table 5 that is the most stringent specification including sector-destination-year fixed effects with only 37 degrees of freedom (of which only 3 correspond to developed countries) is significant at a slightly lower level than the 10 percent confidence level and the magnitude of the coefficient remains similar to previous specifications.

per capita on the number of exporters and on average exporter size is smaller but remains positive and significant overall.

Finally, a potential concern about the results in Table 4 is that our measures are defined only for cells with a positive export flow but trade zeros can be important. By expanding our original data to have zeros in cells with no export flows, we find that the prevalence of trade zeros is negligible in the country-sector-year data (5.9% on average across countries) but is very large in the country-destination-year data (47% on average across countries) and the country-sector-destination-year data (91% on average across countries). The trade zeros in our data are not random but rather are more prevalent both in smaller countries and in less developed countries. Hence our findings could be influenced by the relationship between zeros, country size and stage of development. To investigate this possibility we use the non-linear Poisson pseudo-maximum-likelihood (PPML) estimator introduced by Silva and Tenreyro (2006) to estimate our specifications in Table 4 using the expanded data.[27] The corresponding estimates, shown in Table 6, reveal that our main results on stage of development are robust to the inclusion of zeros.[28] With the exception of average exporter size, the results on country size are robust in the country-sector and country-destination regressions, and all results remain strong in the country-sector-destination regressions.

Stylized Fact on export-sector characteristics: Larger economies and more developed economies have more exporters, a larger average exporter size, and more concentrated export sectors among

[27] Egger and Staub (2015) and Fally (2015) provide extensive discussions of the theoretical and econometric properties of the PPML estimator.

[28] We do not report results on the share of the top 5% using the expanded data in Table 6 because concentration is undefined, but not necessarily small, when trade is missing. Interpreting missing values as low levels biases the results towards finding higher concentration in larger and more developed countries, which have fewer cells with missing exports. Indeed, when we estimate using PPML, the results are qualitatively similar to previous results but with larger coefficients.

firms, after controlling for the sectoral distribution of exports and for export destinations. The extensive margin explains about two thirds of the variation in exports across countries of different size. The extensive margin is relatively less important in explaining why richer countries export more.

4.2 Exporter Dynamics and Country Characteristics

We next turn to exporter entry, exit and survival. Figure 3 shows how exporter entry, exit, and survival vary with country size and stage of development, using country-year level data averaged for the period 2006-2008. With respect to entry and exit, there is a negative relationship indicating that richer countries and larger countries have lower entry and exit rates. The relationship with entrant survival is less transparent.

Columns (1)-(5) of Table 7 show the results from regressions of exporter entry, exit, first-year survival of new exporters, net entry, and turnover on log GDP per capita and log GDP based on the country-sector-year level data for years 2004 to 2008, controlling for sector and year fixed effects.[29] It is crucial to account for sector fixed effects as some sectors have much lower turnover than others, as highlighted by the relative importance of sector effects in the ANOVA (Table 3). The results show that controlling for the sectoral composition of trade, stage of development has important effects on exporter dynamics. In particular, richer countries have lower turnover and higher rates of entrant survival, leaving net entry roughly unchanged. The economic magnitudes of the results are sizable—increasing GDP per capita from the value for the country in the 25th percentile (Cameroon) to the value for the country in 75th percentile (Lebanon) would lead to a

[29] Turnover is calculated as the sum of the entry rate and exit rate in year *t*, while net entry is the difference between entry and exit rates in year *t*.

decline in entry and exit rates by 11 percentage points, and to an increase in the first-year survival rate of entrants by 6 percentage points.[30]

In columns (6)-(10) of Table 7 we report results using country-destination-year level data for years 2004 to 2008 and controlling for destination and year fixed effects, along with bilateral gravity variables. The results on the effect of stage of development are qualitatively similar to the results using country-sector-year level data, though the magnitudes are smaller. In this case, there is evidence that country size also matters, with larger countries having lower entry and exit and higher entrant survival rates.

Columns (11)-(15) of Table 7 show results based on the country-sector-destination-year level data for years 2004 to 2008, considering interacted sector-destination fixed effects, along with year fixed effects and bilateral gravity variables. The evidence indicates a strong negative effect of income per capita on exporter turnover and a strong positive effect of income per capita on entrant survival within sector-destination cells for this sample including 34 developing countries and 3 developed countries. Moreover, the findings are maintained in specifications that include more stringent sector-year, destination-year and sector-destination-year fixed effects, as seen in Appendix Table A2.2 (Panel B).

These results show that exporter dynamics change as countries get richer. In less developed countries, turnover is largely a process of entry and exit where many firms enter into export markets and exit almost immediately. In richer countries, fewer but more resilient exporters enter in any given year.

[30] These magnitudes are obtained as the product of the difference in logs GDP per capita, 1.704, and the corresponding coefficient in columns (1)-(3) of Table 7: -0.063, -0.063, and 0.038.

Stylized Fact on exporter dynamics: Exporter turnover is significantly lower in more developed countries, exporter entrant survival is higher, while net entry is invariant with respect to income per capita, controlling for the sectoral distribution of exports and for export destinations.

5. Discussion of the Results

The standard heterogeneous firm trade model predicts that holding the distribution of firm productivity constant across countries, the extensive margin should explain why larger countries export more. As theory predicts, we do find that the extensive margin dominates the intensive margin in explaining cross-sectional variation in exports, though there is still a significant role for the intensive margin. Specifically, the extensive margin explains about two thirds of the effect of country size on total exports. The importance of the intensive margin in explaining why larger countries export more suggests that the firm productivity distribution may vary in a systematic way with country size and warrants further study.[31]

The intensive margin is relatively more important in explaining the variation in exports owing to stage of development. Specifically, within a sector-destination, average exporter size explains more than half of the effect of GDP per capita on total exports. We argue that the relationship between stage of development and both the intensive margin and concentration at the top of the distribution is consistent with better resource allocation across firms in more developed countries along the lines suggested by Bento and Restuccia (2014), where the most productive

[31] Consistent with our finding, Spearot (2013) adapts a heterogeneous firm model, allowing the Pareto shape parameter of the firm productivity distribution to vary across countries. He shows that such an accommodation can explain variation in the average size of exporters across countries. He further shows that the response of export flows across countries of varying sizes to a trade shock can be used to estimate the Pareto shape parameters across countries. Using this methodology, he finds that larger and richer countries have more skewed firm productivity distributions (hence exporter size distributions), a result that could explain our findings on the larger average size in larger and richer countries. His model, however, does not explain why the Pareto shape parameter is more skewed in larger or richer countries. Alternatively, Head, Mayer, and Thoenig (2014) show that a lognormal distribution fits the observed exporter size distribution of French and Chinese firms better than a Pareto. Such a distribution could allow for a link between the intensive margin and country size, within a heterogeneous firm framework.

firms fail to invest enough.[32] Our finding in Tables 4 and 6 that as trade costs (as measured by the gravity variables) fall, average size and concentration at the top of the exporter size distribution rise, is also consistent with the allocative efficiency story. To the extent that higher trade costs impede competition, allowing a less efficient allocation of resources to persist, we would expect the largest and most productive firms to perform especially well when the distortions are reduced. In Section 5.1, we turn to time-series evidence as a further robustness test of the results.

The results on exporter dynamics also speak to a more efficient allocation of resources in more developed countries. Better firms grow and these high-productivity firms are less likely to exit immediately following entry into the export market. The relatively higher entry and exit in developing countries suggests that the distortions relating to uncertainty about export profitability are greater than entry cost distortions. Effectively, there is a lot of trial and error in exporting, especially in less developed countries where exit goes up precisely because there are more entrants. Indeed, this is consistent with high correlations between entry and exit at the country level and country-sector level.[33]

5.1 Average Exporter Size and Concentration and Allocative Efficiency

While the results are consistent with high-productivity firms failing to invest enough, resulting in too few large firms and lower exports at an earlier stage of development, they could alternatively reflect systematic differences in the underlying productivity distributions and not be a result of resource allocation. To explore how changes in the allocation of resources affects the number of

[32] Consistent with better resource allocation in richer countries, we also find in unreported results evidence of more diversification at the firm level as countries get richer. This is consistent with models of multiproduct firms, such as Bernard, Redding and Schott (2011), where only higher-ability firms are able to generate variable profits to cover fixed costs of entry for more products and thus supply a wider range of products to each market.

[33] For example, using the data for years 2004 to 2008, the simple within-country correlation between entry and exit is 0.77 and the within-country-sector correlation between entry and exit is 0.76.

exporters, average exporter size, and concentration, we consider times-series evidence. We use country-sector-destination-year level data for years 2004 to 2008 for the sample of 34 developing countries and 3 developed countries. Assuming the productivity distribution is constant within country-sectors over time, focusing on within-country-sector variation allows us to rule out differences in the productivity distribution as the cause. The disadvantage of panel data is that the effect of independent variables that have little within-country-sector variation, like country size and stage of development, are harder to isolate with precision. For this reason, we focus on export growth, which varies across countries, sectors, and destinations.

One problem with using export growth is that its underlying cause is important. For example, exports could grow because of demand or supply shocks, which may affect exporter behavior but be unrelated to the resource allocation across firms in the country. To examine export growth that is likely to be a result of changes in resource allocation, we control for country-sector-year fixed effects, which capture productivity shocks (as well as other country-sector time-varying factors in the exporting country-sector). We also include destination-sector-year fixed effects, which capture demand shocks (or other destination-sector-year time-varying factors) in the importing country-sector in our most stringent specification. This allows us to decompose export growth in a sector that is specific to the bilateral relationship, and hence very likely related to changes in trade costs, which we know affect resource allocation. For example, we are decomposing Peru's export growth in apparel to the US that did not result from an increase in overall US demand for apparel or from Peruvian export growth in apparel.

The null hypothesis that we test is that export growth in a country-destination-sector is uncorrelated with average exporter size and exporter concentration, controlling for country-sector-year shocks and destination-sector-year shocks. A positive correlation between export growth and

both variables shows that exporters become on average larger and the firm-size distribution becomes heavier at the top as exports grow.

To the extent that better resource allocation promotes export growth, we would expect average exporter size to increase and exporter concentration to intensify as exports grow. If differences in average exporter size and concentration are more closely related to the underlying firm productivity distribution than to allocative efficiency then there need not be any correlation between export growth and average exporter size and concentration, especially after controlling for country-sector-year effects and destination-sector-year fixed effects.

Table 8 reports results using the country-sector-destination-year level data with country-sector-destination (panel) fixed effects and country-sector-year and destination-sector-year fixed effects. Nearly 90 percent of the time-series variation in exports in comes from larger exporters. The estimated within-effects show that, as exports grow, the average size of exporters and the share of exports by the top 5 percent increase significantly. To the extent that export growth reflects improved resource allocation over time, these results suggest that export growth is associated with more resources being allocated to the largest (and presumably most productive) exporters.[34]

6. Conclusion

While the literature on exporter dynamics is rapidly growing, there has not been a comparison across a large number of countries of different sizes and at differing stages of development. The

[34] In a robustness check we estimated similar regressions using the country-sector-destination-year level data but focusing on a sample of countries for which 8 years of data are available, which allows to observe differences over a relatively longer period of time. The results are very similar to those in Table 8.

Exporter Dynamics Database fills this gap and establishes two novel stylized facts on how export-sector characteristics and dynamics vary with country characteristics.

The data point to systematic ways in which the micro structure of exports changes as countries develop. Larger countries and richer countries have both more and larger exporters on average, with greater concentration in the top 5 percent of firms. Together with results from previous studies showing that exporters are more productive than non-exporters and larger exporters are more productive than smaller exporters, our results are consistent with allocative efficiency in export markets improving as countries develop, with more resources flowing to the largest and most productive firms.

Of interest is how reallocation happens. In particular, exporter dynamics are also closely linked with stage of development, with richer countries experiencing higher entrant survival rates and lower entry and exit rates. This is consistent with allocative efficiency improving as countries develop: only the more productive firms grow and enter the export market in more developed countries, and these relatively good firms are less likely to exit. The results suggest that the distortion that affects exporter dynamics across countries is more closely related to variation in the idiosyncratic uncertainty about the profitability of exporting than to the costs of entry into exporting.

Overall, we hope that the measures in the Database will allow the examination of several interesting cross-country questions, cross-country cross-sector questions, and within-country questions. The measures can also be used as controls in estimations that require exporter characteristics at the country-sector level. In particular, as the measures in the Database offer the first opportunity to study exporter behavior on a global basis, some of the facts described above open the door to questions such as: Does trade promote growth via firm size or firm count? How

can countries attract more large multi-product firms? What determines exporter survival? How does comparative advantage relate to the typical exporter characteristics in an industry? These and many other questions will hopefully be addressed in future research to be conducted using the Database.

References

Ahn, J. B., A. Khandelwal, and S.J. Wei (2011) "The Role of Intermediates in Facilitating Trade," *Journal of International Economics* 84: 73-85.

Albornoz, F., H. Calvo Pardo, G. Corcos and E. Ornelas (2012). "Sequential Exporting," *Journal of International Economics* 88: 17-31.

Alfaro, L., A. Charlton and F. Kanczuk (2009). "Plant-Size Distribution and Cross-Country Income Differences" in J. Frankel and C. Pissarides (eds.), *NBER International Seminar on Macroeconomics 2008*. National Bureau of Economic Research, Inc.

Amador, J. and L. Opromolla (2013). "Product and Destination Mix in Export Markets," *Review of World Economics* 149: 23-53.

Andersson, M., H. Lööf and S. Johansson (2008). "Productivity and International Trade: Firm Level Evidence from a Small Open Economy," *Review of World Economics* 144: 774-801.

Araujo, L., G. Mion and E. Ornelas (2015). "Institutions and Export Dynamics," *Journal of International Economics* forthcoming.

Bartelsman, E., J. Haltiwanger and S. Scarpetta (2013). "Cross-Country Differences in Productivity: The Role of Allocation and Selection," *American Economic Review* 103: 305-334.

Bento, P. and D. Restuccia (2014). "Misallocation, Establishment Size and Productivity," University of Toronto Working Paper Series, # 517.

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.

Bernard, A., J. Jensen, S. Redding, and P. Schott (2007). "Firms in International Trade," *Journal of Economic Perspectives* 21: 105-130.

Bernard, A., J. Jensen, S. Redding, and P. Schott (2012). "The Empirics of Firm Heterogeneity and International Trade," *Annual Review of Economics* 4: 283-313.

Bernard, A., R. Massari, J. Reyes, and D. Taglioni (2013). "Exporter Dynamics, Firm Size and Growth, and Partial Year Effects," Policy Research Working Paper No. 6711, The World Bank.

Bernard, A., S. Redding and P. Schott (2011). "Multi-Product Firms and Trade Liberalization," *Quarterly Journal of Economics* 126: 1271-1318.

Cebeci, T. (2012). "A Concordance among Harmonized System 1996, 2002 and 2007 Classifications," World Bank mimeo available at http://econ.worldbank.org/exporter-dynamics-database.

Cebeci, T., A. Fernandes, C. Freund, and M. Pierola (2012). "Exporter Dynamics Database," Policy Research Working Paper No. 6229, The World Bank.

Chan, J. (2014). "Trade Intermediation, Financial Frictions, and the Gains from Trade," Stanford University mimeo.

De Lucio, J., R. Mínguez-Fuentes, A. Minondo, and F. Requena-Silvente (2011). "The Extensive and Intensive Margins of Spanish Trade," *International Review of Applied Economics* 25: 615-631.

Easterly, W. and A. Reshef (2014). "African Export Successes: Surprises, Stylized Facts, and Explanations," in S. Edwards, S. Johnson, and D. Weil (eds.) *African Successes: Modernization and Development*. University of Chicago Press.

Eaton, J., M. Eslava, M. Kugler, and J. Tybout (2008). "Export Dynamics in Colombia: Transactions Level Evidence," Borradores de Economia No. 522, Banco de la Republica, Colombia.

Eaton, J., S. Kortum, and F. Kramarz. (2008). "An Anatomy of International Trade: Evidence from French Firms," *Econometrica* 79: 1453-1498.

Egger, P. and K. Staub (2015). "GLM Estimation of Trade Gravity Models with Fixed Effects," *Empirical Economics* forthcoming.

Ekholm, K., A. Moxnes, and K. Ulltveit-Moe (2012). "Manufacturing Restructuring and the Role of Real Exchange Rate Shocks: A Firm-Level Analysis," *Journal of International Economics* 86: 101-117.

Fabling, R. and L. Sanderson (2012). "Whatever Next? Export Market Choices of New Zealand Firms," *Papers in Regional Science* 91: 137-159.

Fally, T. (2015). "Structural Gravity and Fixed Effects," *Journal of International Economics* forthcoming.

Freund, C. and M. Pierola (2010). "Export Entrepreneurs Evidence from Peru," Policy Research Working Paper No. 5407, The World Bank.

Freund, C. and M. Pierola (2015). "Export Superstars," *Review of Economics and Statistics* forthcoming.

Guimaraes, P. and P. Portugal (2010). "A Simple Feasible Alternative Procedure to Estimate Models with High-Dimensional Fixed Effects," *Stata Journal*, 10: 628-649, 2010.

Hanson, G., N. Lind, and M. Muendler (2014). "The Dynamics of Comparative Advantage," University of California at San Diego mimeo.

Head, K., T. Mayer, and M. Thoenig (2014). "Welfare and Trade without Pareto," *American Economic Review Papers and Proceedings* 104: 310-316.

Hsieh, C.-T. and P. Klenow (2009). "Misallocation and Manufacturing TFP in China and India," *Quarterly Journal of Economics*, 124: 1403-48.

Hsieh, C.-T. and B. Olken (2014). "The Missing Middle," *Journal of Economic Perspectives* 28: 89-108.

Iacovone, L. and B. Javorcik (2010). "Multi-Product Exporters: Product Churning, Uncertainty, and Export Discoveries," *Economic Journal* 120: 481-499.

Lawless, M. (2010). "Deconstructing Gravity: Trade Costs and the Extensive and Intensive Margins," *Canadian Journal of Economics* 43: 1149-1172.

Manova, K. and Z. Zhang (2012). "Export Prices across Firms and Destinations," *Quarterly Journal of Economics* 127: 379-436.

Masso, J. and P. Vahter (2015). "Exporting and Productivity: the Effects of Multi-Market and Multi-Product Export Entry," *Scottish Journal of Political Economy* 62, 325–350.

Mayer, T. and G. Ottaviano (2008). "The Happy Few: The Internationalisation of European Firms," *Intereconomics: Review of European Economic Policy* 43: 135-148.

Mayer T. and S. Zignago (2011). "Notes on CEPII's Distances Measures (GeoDist)," CEPII Working Paper No. 2011-25.

Melitz, M. (2003). "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica* 71: 1695-1725.

Rauch, J. and J. Watson (2003). "Starting Small in an Unfamiliar Environment," *International Journal of Industrial Organization* 21: 1021-1042.

Schott, P. and J. Pierce (2012). "Concording U.S. Harmonized System Codes over Time," *Journal of Official Statistics* 28: 53–68.

Segura-Cayuela, R. and J. Vilarrubia (2008) "Uncertainty and Entry into Export Markets,"Banco de España Working Paper No. 0811.

Silva, J. and S. Tenreyro (2006). "The Log of Gravity," *Review of Economics and Statistics* 88: 641-658.

Spearot, A. (2013). "Tariffs, Competition, and the Long of Firm Heterogeneity Models," University of California – Santa Cruz. Mimeo.

Syverson, C. (2004), "Product Substitutability and Productivity Dispersion," *Review of Economics and Statistics* 86: 534-50.

Tybout, James (2000). "Manufacturing Firms in Developing Countries: How Well Do They Do and Why? *Journal of Economic Literature* 38:11-44.

Tybout, James (2014). "The Missing Middle, Revisited" Penn State, Mimeo.

Wagner, J. (2012). 'International Trade and Firm Performance: A Survey of Empirical Studies since 2006,' *Review of World Economics* 148: 235-267.

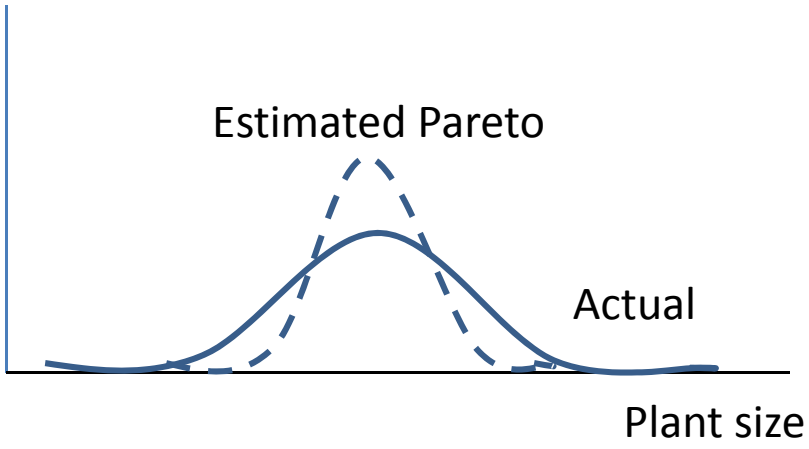
Wagner, R. and A. Zahler (2011). "New Exports from Emerging Markets: Do Followers Benefit from Pioneers?," MPRA Paper No. 30312, University Library of Munich, Germany.

United Nations (1998). International Merchandise Trade Statistics: Concepts and Definitions.

United Nations (2008). International Merchandise Trade Statistics: Supplement to the Compilers Manual.

Figure 1: Firm-Size Distribution

Panel A: Tybout's Finding for Developing Countries



Panel B: Hsieh and Klenow's Findings for China and India

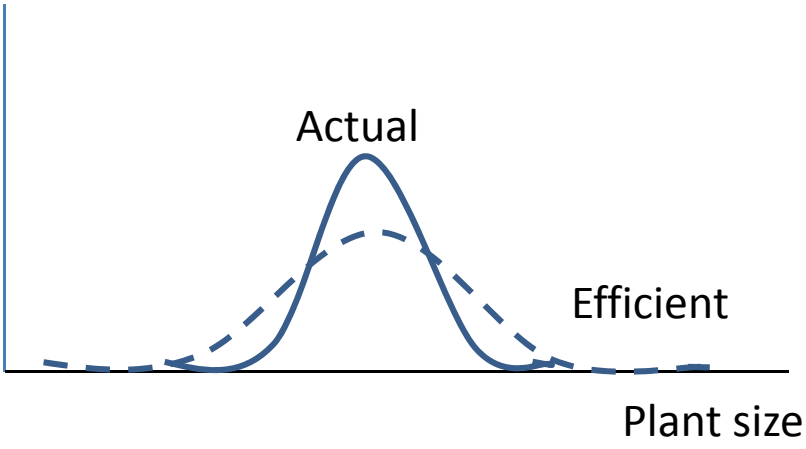
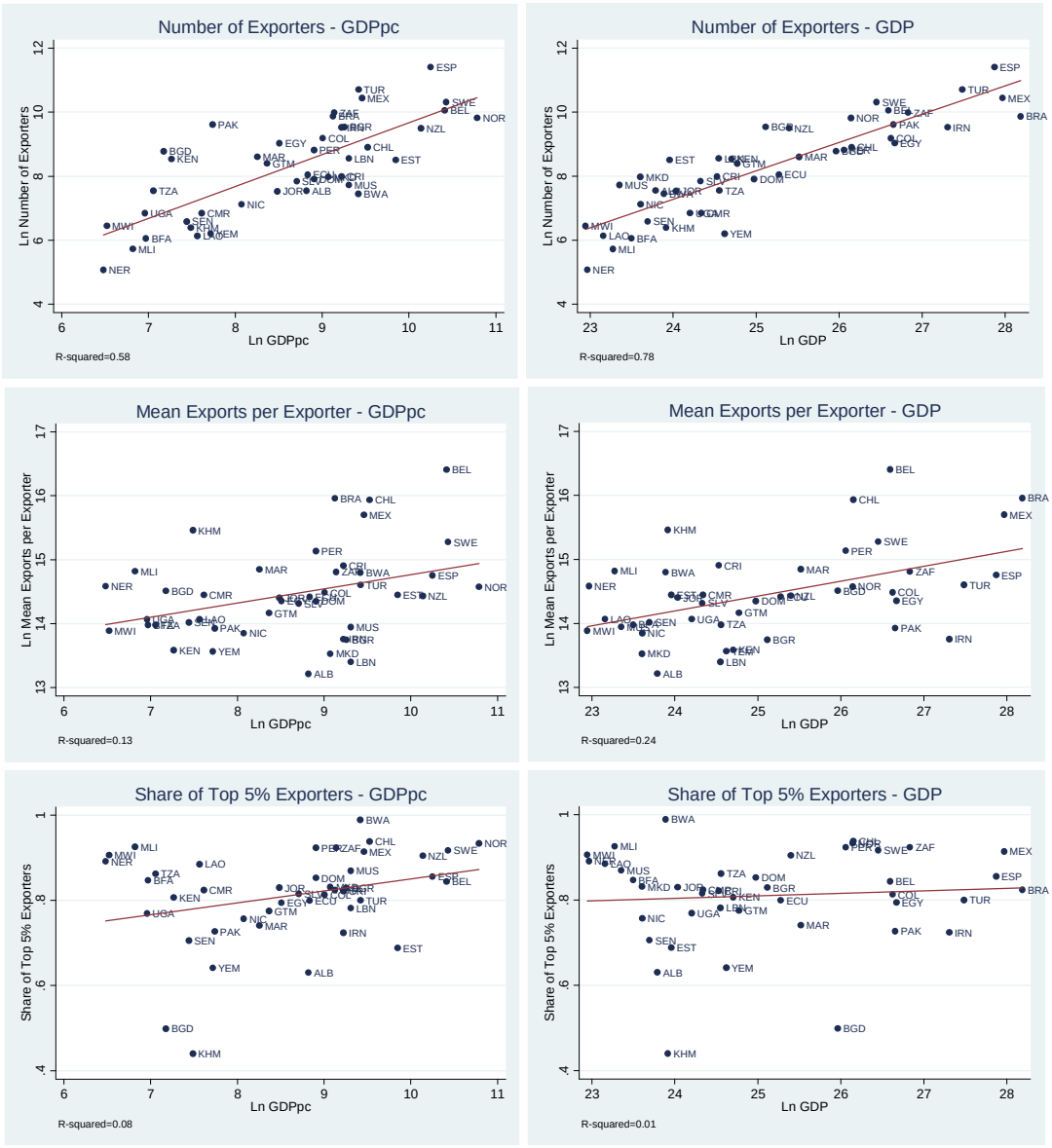
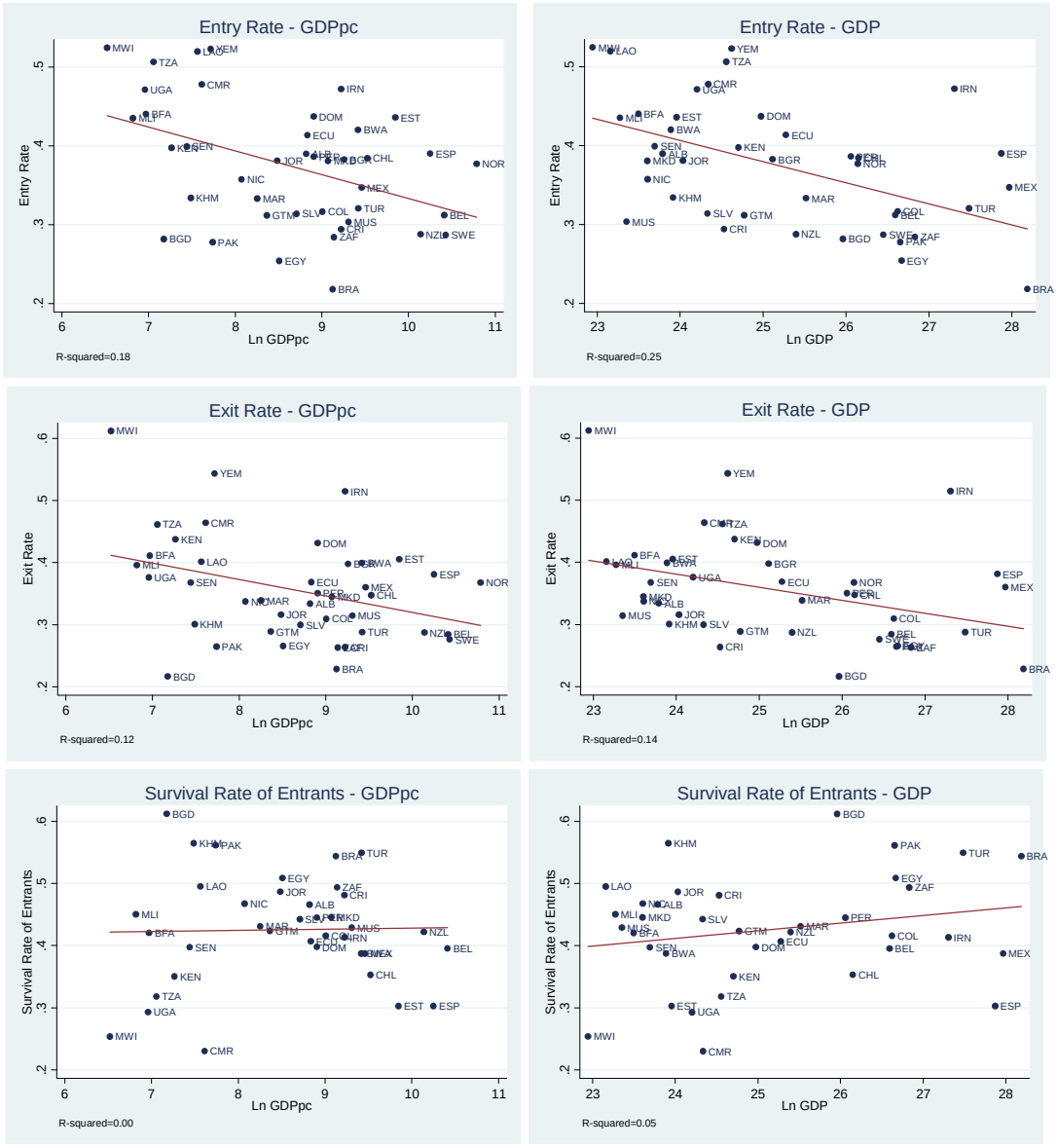


Figure 2: Export-Sector Characteristics, Country Size and Stage of Development (Averages over 2006-2008)



Notes: The measures plotted are based on measures in the country-year level dataset averaged across the 2006-2008 period for each country. GDP per capita is measured in 2005 PPP U.S. dollars per inhabitant. Kuwait and Portugal are excluded from these plots due to lack of data for the 2006-2008 period.

Figure 3: Exporter Dynamics, Country Size and Stage of Development



Notes: The measures plotted are based on measures in the country-year level dataset averaged across the 2006-2008 period for each country. GDP per capita is measured in 2005 PPP U.S. dollars per inhabitant. Kuwait and Portugal are excluded from these plots due to lack of data for the 2006-2008 period.

Table 1: Measures by Country (2006-2008 Averages)

		Total Exports (bn USD)	Number of Exporters	Number of Exporters per 1000 Inhabitants	Mean Exports per Exporter ('000s USD)	Median Exports per Exporter ('000s USD)	Share of Top 5% Exporters	Entry Rate	Exit Rate	Entrant Survival Rate
ALB	Albania *	1.1	1,895	0.60	550	35	63%	39%	33%	47%
BEL	Belgium	309.1	23,204	2.18	13,312	64	84%	31%	28%	40%
BFA	Burkina Faso *	0.5	425	0.03	1,177	37	85%	44%	41%	42%
BGD	Bangladesh *	12.4	6,356	0.05	1,946	277	50%	28%	22%	61%
BGR	Bulgaria *	12.9	13,804	1.79	934	22	83%	38%	40%	
BRA	Brazil	165.4	19,375	0.10	8,539	233	82%	22%	23%	54%
BWA	Botswana *	4.6	1,715	0.89	2,666	2	99%	42%	40%	39%
CHL	Chile *	60.9	7,314	0.44	8,317	49	94%	38%	35%	35%
CMR	Cameroon *	1.7	938	0.05	1,879	19	82%	48%	46%	23%
COL	Colombia *	19.1	9,768	0.22	1,957	58	81%	32%	31%	42%
CRI	Costa Rica *	8.7	2,931	0.66	2,970	54	82%	29%	26%	48%
DOM	Dominican Republic *	4.5	2,709	0.28	1,708	26	85%	44%	43%	40%
ECU	Ecuador *	5.7	3,110	0.22	1,830	25	80%	41%	37%	41%
EGY	Egypt *	14.3	8,370	0.11	1,717	65	79%	25%	27%	51%
ESP	Spain	229.9	89,798	2.00	2,559	21	86%	39%	38%	30%
EST	Estonia	9.3	4,915	3.66	1,885	109	69%	44%	41%	30%
GTM	Guatemala *	6.3	4,420	0.33	1,421	38	78%	31%	29%	42%
IRN	Iran *	12.8	13,770	0.19	940	88	72%	47%	51%	41%
JOR	Jordan *	3.4	1,869	0.33	1,804	57	83%	38%	32%	49%
KEN	Kenya *	4.0	5,057	0.14	796	18	81%	40%	44%	35%
KHM	Cambodia *	3.4	595	0.04	5,706	546	44%	33%	30%	57%
KWT	Kuwait [a]	3.0	3,315	1.23	915	27	86%	53%	53%	
LAO	Laos	0.6	462	0.08	1,284	42	88%	52%	40%	50%
LBN	Lebanon *	3.4	5,177	1.24	659	38	78%			
MAR	Morocco *	15.3	5,429	0.18	2,811	90	74%	33%	34%	43%
MEX	Mexico *	226.3	34,382	0.31	6,588	44	91%	35%	36%	39%
MKD	Macedonia *	2.2	2,926	1.43	751	24	83%	38%	35%	45%
MLI	Mali *	0.8	305	0.02	2,729	48	93%	43%	39%	45%
MUS	Mauritius *	2.6	2,251	1.79	1,138	17	87%	30%	31%	43%
MWI	Malawi *	0.6	631	0.05	1,077	8	91%	52%	61%	25%
NER	Niger *	0.3	160	0.01	2,160	18	89%			
NIC	Nicaragua *	1.3	1,236	0.22	1,031	27	76%	36%	34%	47%
NOR	Norway	39.1	18,309	3.93	2,137	14	93%	38%	37%	
NZL	New Zealand	24.6	13,276	3.14	1,853	24	90%	29%	29%	42%
PAK	Pakistan *	16.8	15,023	0.09	1,116	62	73%	28%	27%	56%
PER	Peru *	25.2	6,732	0.24	3,740	37	92%	39%	35%	44%
PRT	Portugal [a]	33.5	16,217	1.44	2,064	68	77%	30%	29%	45%
SEN	Senegal *	0.9	727	0.06	1,228	73	71%	40%	37%	40%
SLV	El Salvador *	4.2	2,554	0.42	1,648	30	82%	31%	30%	44%
SWE	Sweden	129.5	30,126	3.32	4,299	17	92%	29%	28%	
TUR	Turkey	98.7	44,570	0.64	2,204	105	80%	32%	29%	55%
TZA	Tanzania *	2.3	1,899	0.05	1,180	17	86%	51%	46%	32%
UGA	Uganda *	1.2	938	0.03	1,289	15	77%	47%	38%	29%
YEM	Yemen *	0.4	492	0.02	779	49	64%	52%	54%	
ZAF	South Africa *	58.8	21,721	0.45	2,699	29	92%	28%	26%	49%
Average - developing countries		21.7	7,017	0.49	2,206	63	81%	38%	37%	43%
Median - developing countries		4.2	2,931	0.22	1,708	37	82%	38%	35%	43%
Average - all countries		35.1	10,027	0.77	2,489	61	81%	38%	36%	43%
Median - all countries		5.7	4,420	0.28	1,830	37	82%	38%	35%	43%

Notes: The figures shown are based on measures in the country-year level dataset averaged across the 2006-2008 period for each country. * indicates a developing country for which we have access to the raw exporter-level data. [a] indicates exceptions to the sample period: for Kuwait averages are taken across the 2009-2010 period and for Portugal averages are taken across the 2003-2005 period. Total exports are obtained as the number of exporters multiplied by the average exports per exporter.

Table 2: Measures by Broad Sector (2006-2008 Averages)

HS 2-Digit Codes	HS Section Description	Number of Exporters	Mean Exports per Exporter ('000s USD)	Median Exports per Exporter ('000s USD)	Share of Top 5% Exporters	Entry Rate	Exit Rate	Entrant Survival Rate
01-05	Live Animals and Animal Products	108	1,109	107	53%	49%	48%	38%
06-15	Vegetable Products (including Animal and Vegetable Fats)	168	631	40	58%	50%	48%	36%
16-24	Foodstuff (Beverages, Spirits, Vinegar, Tobacco etc.)	147	1,427	147	63%	46%	43%	38%
25-26	Mineral Products (except hydrocarbons)	199	9,730	294	76%	54%	49%	36%
28-38	Chemicals and Parachemical Products	201	1,205	50	73%	53%	51%	31%
39-40	Plastics and Articles Thereof	989	408	7	77%	54%	51%	33%
44-46, 47-49, 94	Wood and Articles Thereof (including Paper & Articles, Furniture)	476	1,221	55	73%	57%	56%	28%
50-59, 41	Textiles (Including Raw Skins and Leather)	153	413	30	66%	58%	57%	27%
60-63, 64-67, 42-43	Apparel (Including Footwear, Headgear, Art. of Feathers, Fur, Leather Products)	353	402	35	69%	58%	57%	28%
68-70	Glass, Ceramics and Articles of Stone, Cement, etc.	429	212	4	76%	60%	58%	26%
71	Precious Metals (Pearls, Jewellery, Coin, Precious Stones etc.)	227	7,503	473	78%	50%	47%	33%
72-83	Base Metal and Articles Thereof	327	2,010	26	75%	60%	58%	26%
84, 91-92	Mechanical Machinery (including Clocks and Music Instruments)	870	252	8	72%	62%	61%	24%
85, 90	Electrical Machinery (including Optical, Medical, Photographic Instruments)	1,183	737	8	76%	57%	54%	30%
86-89	Transportation Vehicles	326	1,275	41	71%	65%	63%	24%
93	Arms and Ammunitions	25	523	39	69%	59%	61%	19%

Notes: The figures shown in the table for each group of sectors are based on measures at the country-year- sector level averaged across HS2-digit codes within the groups listed in the first column, countries and the 2006-2008 period. Brazil, Kuwait, New Zealand, and Portugal are excluded from those averages due to lack of measures at the country-year-HS 2-digit sector level (Brazil and New Zealand) or to lack of data for the 2006-2008 period (Kuwait and Portugal).

Table 3: ANOVA Decompositions at Country and Sector and Country and Destination Level

Panel A: Country- Sector Data

	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate
Country	47%	56%	23%	26%	28%	27%	14%	11%	27%
HS 2-digit Sector	29%	32%	30%	22%	17%	18%	16%	3%	18%
Residual	29%	15%	48%	57%	56%	55%	70%	85%	56%
Observations	3,621	3,750	3,621	2,584	3,571	3,584	3,167	3,504	3,504

Panel B: Country-Destination Data

	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate
Country	29%	38%	14%	21%	17%	16%	8%	4%	11%
Destination	40%	36%	30%	21%	20%	18%	13%	8%	13%
Residual	43%	36%	61%	65%	66%	68%	80%	89%	77%
Observations	5,558	6,636	5,558	2,887	6,289	6,236	5,406	5,497	5,497

Notes: The variance decompositions shown are based on measures at the country-sector-year level in Panel A and country-destination-year level data in Panel B, averaged across the 2006-2008 period for each country. Brazil, Kuwait, New Zealand, and Portugal are excluded from these ANOVA decompositions due to lack of measures at the country-sector-year level (Brazil and New Zealand) or to lack of data for the 2006-2008 period (Kuwait and Portugal). The sums add up to slightly more than 100 percent in some cases because the data form an unbalanced panel. Results are similar if we use a balanced panel.

Table 4: Number of Exporters, Exporter Size, Concentration and Country Characteristics - Country, Country-Sector, and Country-Destination Regressions

	Country-Sector Regressions				Country-Destination Regressions				Country-Sector-Destination Regressions			
	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln GDPpc	0.890***	0.471***	0.419***	0.047***	0.580***	0.388***	0.192***	0.061***	0.398***	0.191*	0.207***	0.022**
	(0.171)	(0.095)	(0.126)	(0.010)	(0.129)	(0.103)	(0.057)	(0.009)	(0.117)	(0.094)	(0.060)	(0.010)
Ln GDP	1.122***	0.690***	0.432***	0.039***	1.099***	0.807***	0.292***	0.038***	0.807***	0.456***	0.351***	0.034***
	(0.107)	(0.069)	(0.088)	(0.007)	(0.112)	(0.093)	(0.046)	(0.007)	(0.100)	(0.073)	(0.056)	(0.006)
Ln Distance					-1.312***	-1.016***	-0.296***	-0.042***	-1.001***	-0.517***	-0.484***	-0.046***
					(0.112)	(0.079)	(0.061)	(0.009)	(0.113)	(0.060)	(0.079)	(0.010)
Contiguity					1.463***	0.863***	0.600***	0.063***	0.742***	0.432***	0.310***	0.057***
					(0.292)	(0.207)	(0.164)	(0.019)	(0.095)	(0.084)	(0.078)	(0.016)
Common language					1.059***	0.826***	0.233***	0.072***	0.597***	0.530***	0.067	0.063***
					(0.181)	(0.140)	(0.081)	(0.016)	(0.179)	(0.104)	(0.119)	(0.015)
Common colonizer					0.640***	0.397***	0.242**	0.032	0.130	-0.124	0.255*	-0.041*
					(0.214)	(0.144)	(0.108)	(0.019)	(0.229)	(0.203)	(0.145)	(0.021)
Sector Fixed Effects	Yes	Yes	Yes	Yes								
Destination Fixed Effects					Yes	Yes	Yes	Yes				
Sector-Destination Fixed Effects									Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,770	14,770	14,770	10,424	20,082	20,082	20,082	10,899	289,954	289,954	289,954	64,018
R-squared	0.626	0.743	0.428	0.320	0.659	0.742	0.341	0.332	0.463	0.501	0.416	0.461

Notes: Robust standard errors in parentheses, clustered at the country level. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. The regressions in columns (1)-(4) are based on measures at the country-sector-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level); those in columns (5)-(8) are based on measures at the country-destination-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level); those in columns (9)-(12) are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data for the 2004-2008 period. The estimating sample for the regressions in columns (1)-(3), (5)-(7) and (9)-(11) excludes observations whose corresponding number of exporters is equal to 1 while that for the regressions in columns (4), (8) and (12) excludes observations whose corresponding number of exporters is smaller than 20.

Table 5: Export-Sector Characteristics and Country Characteristics – The Role of Intermediaries

	Country-Sector Regressions				Country-Sector-Destination Regressions			
	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln GDPpc	1.147***	0.615***	0.532***	0.059***	0.686***	0.306**	0.381***	0.025
	(0.172)	(0.108)	(0.132)	(0.011)	(0.149)	(0.120)	(0.074)	(0.016)
Ln GDP	1.140***	0.663***	0.477***	0.042***	0.869***	0.488***	0.381***	0.036***
	(0.116)	(0.073)	(0.100)	(0.008)	(0.110)	(0.078)	(0.072)	(0.007)
Ln GDPpc * Sectors with more intermediaries	-0.365***	-0.205***	-0.160**	-0.017**	-0.423***	-0.168***	-0.255***	-0.004
	(0.085)	(0.047)	(0.063)	(0.007)	(0.118)	(0.053)	(0.076)	(0.011)
Ln GDP * Sectors with more intermediaries	-0.025	0.038	-0.063	-0.004	-0.088	-0.046	-0.042	-0.003
	(0.064)	(0.032)	(0.048)	(0.004)	(0.091)	(0.036)	(0.063)	(0.004)
Sector Fixed Effects	Yes	Yes	Yes	Yes				
Sector-Destination Fixed Effects					Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,770	14,770	14,770	10,424	289,954	289,954	289,954	64,018
R-squared	0.629	0.745	0.430	0.322	0.467	0.505	0.418	0.461

Notes: Robust standard errors in parentheses, clustered at the country level. *** and ** indicate significance at 1% and 5% confidence levels, respectively. The regressions in columns (1)-(4) are based on measures at the country-sector-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level). The regressions in columns (5)-(8) are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data for any year in the 2004-2008 period. The estimating sample for the regressions in columns (1)-(3) and (5)-(7) excludes observations whose corresponding number of exporters is equal to 1 while that for the regressions in columns (4) and (8) excludes observations whose corresponding number of exporters is smaller than 20. The sectors with more intermediaries are food (HS01-24), apparel (HS41-43 and HS60-67), textiles (HS50-59), metals (HS72-83), machinery (HS84), wood (HS44-46), and miscellaneous (HS90-99).

Table 6: Export-Sector Characteristics and Country Characteristics – Accounting for Zeros in Export Flows

	Country-Sector Regressions PPML estimation			Country-Destination Regressions PPML estimation			Country-Sector-Destination Regressions PPML estimation		
	Total Exports ('000s USD)	Number of Exporters	Mean Exports per Exporter ('000s USD)	Total Exports ('000s USD)	Number of Exporters	Mean Exports per Exporter ('000s USD)	Total Exports ('000s USD)	Number of Exporters	Mean Exports per Exporter ('000s USD)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ln GDPpc	0.924***	0.343***	0.461***	0.618***	0.423***	0.313**	0.472***	0.425***	0.601***
	(0.256)	(0.089)	(0.123)	(0.160)	(0.124)	(0.142)	(0.135)	(0.162)	(0.137)
Ln GDP	0.753***	0.743***	0.106	0.715***	0.819***	0.072	0.774***	0.840***	0.311***
	(0.123)	(0.081)	(0.092)	(0.071)	(0.091)	(0.094)	(0.081)	(0.078)	(0.075)
Ln Distance				-0.428***	-0.543***	0.186	-0.476***	-0.763***	(0.043)
				(0.090)	(0.086)	(0.170)	(0.146)	(0.088)	(0.219)
Contiguity				1.582***	0.549***	0.783***	2.006***	1.053***	1.008***
				(0.198)	(0.122)	(0.230)	(0.138)	(0.127)	(0.280)
Common language				0.209	0.717***	0.623**	0.992***	1.833***	1.183***
				(0.169)	(0.171)	(0.317)	(0.165)	(0.208)	(0.278)
Common colonizer				0.313	0.463	-0.050	-0.478	-0.412	-0.121
				(0.315)	(0.317)	(0.205)	(0.420)	(0.404)	(0.359)
Sector Fixed Effects	Yes	Yes	Yes						
Destination Fixed Effects				Yes	Yes	Yes			
Sector-Destination Fixed Effects							Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,624	15,624	15,624	34,177	34,177	34,177	2,241,843	2,241,843	2,241,843
R-squared	0.553	0.779	0.084	0.896	0.594	0.081			

Notes: Robust standard errors in parentheses, clustered at the country level. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. The estimation method PPML used in columns (1)-(6) is the Poisson Pseudo-Maximum Likelihood proposed by Silva and Tenreyro (2006) while that used in columns (7)-(9) is the modification proposed by Guimaraes and Portugal (2010) to accommodate large numbers of fixed effects. The regressions in columns (1)-(3) are based on measures at the country-sector-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level);); those in columns (4)-(6) are based on measures at the country-destination-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level); those in columns (7)-(9) are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data for the 2004-2008 period. The number of observations in columns (7)-(9) follow the modification by Guimaraes and Portugal (2010) that drops from the estimating sample all observations that belong to a country-sector-destination-year cell where all values of the dependent variable are 0 and the sample in column (8) is forced to be the same as that used in columns (7) and (9).

Table 7. Exporter Dynamics and Country Characteristics - Country-Sector-Destination Regressions

	Country-Sector Regressions					Country-Destination Regressions					Country-Sector-Destination Regressions				
	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Ln GDPpc	-0.063***	-0.063***	0.038***	-0.001	-0.119***	-0.037***	-0.037***	0.016**	0.000	-0.066***	-0.051***	-0.051***	0.024**	0.000	-0.087***
	(0.014)	(0.013)	(0.009)	(0.004)	(0.026)	(0.010)	(0.010)	(0.008)	(0.004)	(0.018)	(0.010)	(0.011)	(0.010)	(0.002)	(0.020)
Ln GDP	-0.004	-0.005	-0.001	0.001	-0.004	-0.032***	-0.030***	0.022***	0.000	-0.027**	-0.014*	-0.015**	0.014***	0.004	0.050***
	(0.010)	(0.009)	(0.006)	(0.004)	(0.018)	(0.009)	(0.008)	(0.005)	(0.003)	(0.013)	(0.007)	(0.006)	(0.004)	(0.003)	(0.015)
Ln Distance						0.052***	0.048***	-0.035***	0.002	0.058***	0.038***	0.035***	-0.022***	0.000	-0.023
						(0.008)	(0.009)	(0.007)	(0.003)	(0.018)	(0.009)	(0.009)	(0.007)	(0.002)	(0.024)
Contiguity						-0.029	-0.042**	0.040***	0.014*	-0.112***	-0.019*	-0.027**	0.015**	0.008**	-0.013
						(0.021)	(0.021)	(0.012)	(0.008)	(0.035)	(0.010)	(0.011)	(0.007)	(0.004)	(0.025)
Common language						-0.043***	-0.031**	0.005	-0.010**	-0.037	-0.023***	-0.024**	0.013*	0.003	0.071***
						(0.013)	(0.014)	(0.010)	(0.004)	(0.024)	(0.008)	(0.009)	(0.007)	(0.003)	(0.016)
Common colonizer						-0.023	-0.022	0.009	-0.005	-0.027	-0.020	-0.022	0.008	0.000	-0.036
						(0.020)	(0.020)	(0.013)	(0.005)	(0.035)	(0.017)	(0.019)	(0.013)	(0.005)	(0.036)
Sector Fixed Effects	Yes	Yes	Yes	Yes	Yes										
Destination Fixed Effects						Yes	Yes	Yes	Yes	Yes					
Sector-Destination											Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,721	13,707	12,429	13,488	13,488	21,075	20,768	18,587	19,137	19,137	428,415	418,408	352,292	338,733	338,733
R-squared	0.257	0.256	0.160	0.011	0.271	0.199	0.185	0.106	0.018	0.143	0.171	0.171	0.114	0.035	0.216

Notes: Robust standard errors in parentheses, clustered at the country level. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. The regressions in columns (1)-(5) are based on measures at the country-sector-year level for years 2004-2008 (Brazil and New Zealand are excluded due to lack of measures at that level); those in columns (6)-(10) are based on measures at the country-destination-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level); and those in columns (11)-(15) are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data for the 2004-2008 period.

Table 8: Export Growth, Average Exporter Size and Concentration

	Country-Sector-Destination Regressions		
	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters
	(1)	(2)	(3)
Ln Total Exports	0.099***	0.901***	0.123***
	(0.007)	(0.007)	(0.005)
Country-Sector-Destination Fixed Effects	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes
Destination-Sector-Year Fixed Effects	Yes	Yes	Yes
Observations	296,031	296,031	65,271
R-squared	0.977	0.993	0.936

Notes: Robust standard errors in parentheses, clustered at the country level. *** indicates significance at the 1% confidence level. The regressions are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data for the 2004-2008 period. The estimating sample for the regressions in columns (1)-(2) excludes observations whose corresponding number of exporters is equal to 1 while that for the regression in columns (3) excludes observations whose corresponding number of exporters is smaller than 20.

APPENDIX

Appendix 1: Constructing the Exporter Dynamics Database Using Customs Data at the Exporter-Level

The measures included in the Database are computed using customs data from 45 countries at the exporter-product-destination-year level covering the universe of export transactions.[35] For 11 countries (Brazil, the Arab Republic of Egypt, Estonia, Lao PDR, New Zealand, Norway, Portugal, Spain, Sweden, and Turkey), we do not have access to the raw data and the statistics were calculated for us by researchers or institutions with access to the raw data. Pooling across the raw datasets for the remaining 34 countries, we obtain a panel with 15 million unique observations at the country-firm-product-destination-year level which is the raw dataset used to construct the Database. Some of the variables in this cross-country raw dataset were subjected to a series of cleaning procedures or had peculiarities that we briefly describe below: firm codes, country of destination, product and export values.[36]

Regarding firm codes, exporters are uniquely identified by their actual names, their tax identification number or artificial unique codes randomly created by our data providers. In the case of Albania, Burkina Faso, Cambodia, Cameroon, Mexico, and Uganda their firm coding systems underwent changes in 2007 and in the case of Yemen in 2008. Hence, it is not possible to calculate exporter dynamics measures in the years when those changes occur.

Regarding the country of destination variable, two cleaning operations are applied. One relates to the use of special trade regimes by Bulgaria, Costa Rica, Colombia, Ecuador, Egypt, Jordan, Kuwait, Lebanon, Morocco, Peru, Turkey, Yemen, which implies that customs agencies record the sales from inland to their own free zones/customs warehouses as exports resulting in a larger set of potential destinations.[37] Since there is a lack of uniformity across countries in the definition of the special trade regime we drop the observations related to sales to free zones from our dataset.[38] The other relates to the changes in names that some statistical territories have undergone over time due to spatial divisions. When territories split, we keep them as a single destination since disregarding these changes in names would bias some calculations, especially those related to destination diversification and dynamics. In the end, each country has a potential set of 246 destinations as of end-2011.

Regarding products, although most customs agencies record export transactions at 8-digit of the Harmonized System (HS) or higher, we aggregate the information to the HS 6-digit, since this is the most detailed level comparable internationally. Several cleaning operations are applied to the product variable given that our sample period spans three different HS classifications (HS1996, HS2002 and HS2007). First, we combine all the codes existing under the three HS classifications into an aggregated list of 6065 unique HS 6-digit codes and eliminate the

[35] The providers of the raw datasets for each country were mostly governmental agencies, mainly customs offices. Appendix 1 in Cebeci et al. (2012) provides a complete list of the countries included in the Database, the periods for which data is available, and the data sources.

[36] Cebeci et al. (2012) describe the cleaning procedures in further detail. Note that the cross-country raw dataset at country-firm-product-destination-year level includes also quantities exported.

[37] The "special trade regime" considers transactions where the goods are sold from the domestic territory *only* to both third countries and free zones/customs warehouses of the origin country as exports. In contrast, the "General trade regime" considers transactions where goods are sold from any national territory (*including free zones*) to third countries only as exports (see p. 32 of United Nations, 2008).

[38] See p. 34 of United Nations (1998). This operation had a minor effect on total export volumes as sales to free zones/customs warehouses are negligible in most cases. The export volumes of Turkey, the country most affected by this operation, drop by 2-3 percent.

observations with a code that is not in that list.[39] Second, through a process of "consolidation" among the three HS classifications, we account for the modifications introduced in each of the HS revisions: a) two different codes with low trade volume were converted into a single code and b) an existing code with an increasing trade volume was split into various codes. Ignoring these modifications would create problems for the tracking of trade volumes for certain products over time.[40] The basic principle of consolidation is to identify the HS codes related to each other (e.g., codes that were split or merged with the modifications introduced by the HS2002 or the HS2007) and to replace them with a single code for the entire period. As a result of this consolidation. The final number of unique potential HS 6-digit codes in the consolidated classification is 4961.[41] In our cross-country raw dataset 4767 of those 4961 HS 6-digit codes are present. In terms of the array of products included in the cross-country raw dataset, we eliminate observations in HS Chapter 27 (hydrocarbons such as oil, petroleum, natural gas, coal etc.) given that we do not have exporter-level data on that chapter for important oil exporting countries such as Burkina Faso, Cameroon, Iran, Kuwait, and Yemen.[42]

Regarding export values in the cross-country raw dataset, they are measured in US Dollars (USD) and they are Free on Board (FOB) figures, except for El Salvador and Senegal, whose export values represent Cost, Insurance and Freight (CIF) figures.[43] This difference should be taken into account for cross-country comparisons of measures related for example to the size of exporters.

In order to have a sense of the reliability of the raw data in each of the countries included in the Database, we apply two filters. For the first filter we compare the total values exported (excluding HS 27) calculated from the cross-country raw dataset with the total values exported from the United Nations' COMTRADE database (excluding HS 27) for every country and year.[44] This comparison yields quite different results for different countries. On the one hand, for Albania, Brazil, Cameroon, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Kenya, Lebanon Mexico, Morocco, Pakistan, Peru, South Africa, Tanzania and Turkey, the ratio of total values exported in the raw dataset to total values exported in COMTRADE is about 100 percent. While for countries such as Mali and Yemen, the ratios indicate that total values exported in the raw dataset are as low as half of the total values exported in COMTRADE, for others such as Mauritius total values exported in the raw dataset are on average 30 percent above total values exported in

[39] The number of HS categories included in the original classifications HS 1996, HS 2002, and HS 2007 are 5209, 5224, and 5053, respectively. Most of this elimination results from eliminating observations with a product code belonging to HS Chapter 99 as this is reserved for national use and the HS 6-digit codes under this chapter differ across countries. This elimination accounts for about 0.5 percent of total exports in our cross-country raw dataset.

[40] See Cebeci (2012) for the methodology used in the consolidation. The paper along with a list of consolidated codes and concordances are available at http://econ.worldbank.org/exporter-dynamics-database. A similar process was used by Schott and Pierce (2012) to concord 10-digit United States Harmonized System codes between 1989 and 2007 and by Wagner and Zahler (2011) to homologate among 6-digit HS1992, HS1996, and HS2002 classifications.

[41] The number of HS 6-digit codes not affected by the consolidation process is 4559, obtained as the total number of codes 6065 minus the 1104 codes that disappeared and minus the 402 codes whose content changed.

[42] Possible reasons for this lack of data are confidentiality reasons or the fact that goods exported through pipeline are not recorded at customs but instead are recorded by other government/private institutions in the countries.

[43] For countries for which export values were provided in local currency, they were converted to USD using the exchange rate series PA.NUS.FCRF taken from the World Development Indicators (whose original source is the IMF's International Financial Statistics) which is based on an annual average of daily exchange rates determined by national authorities or in the legally sanctioned exchange market.

[44] Given our understanding about which transactions are included in the raw files, for this comparison we consider gross export figures in COMTRADE (which include re-exports) for Albania, Kenya, Mauritius, Tanzania and Senegal and net export figures (gross exports minus re-exports) for Jordan, Uganda and Yemen. For all other countries, it does not matter which COMTRADE figure we choose as they report either insignificant or no re-exports.

COMTRADE.[45] For the second filter, we focus on the countries and years that would have been left out because of a unfavorable match with COMTRADE (below 60 percent) and we keep those countries (and years) where we observe internal consistency within the export totals calculated from the corresponding exporter-level raw dataset over time.[46] As a result of this second filter, we keep in the raw dataset the information for Macedonia, Jordan, Mali, Mauritius, and several years of El Salvador's data which would be left out due to an unfavorable match with COMTRADE data.[47]

To protect the confidentiality of the firms in the raw datasets at the exporter-product-destination-year level, some of the measures in the files with product, destination, or HS 2-digit product-destination disaggregation are missing when the underlying country-product-year, country-destination-year, or country-product-destination-year cell includes a single firm whose individual information cannot be revealed.[48]

For the measures of firm dynamics in the country-year dataset, of firm-sector dynamics in the country-sector-year dataset, of firm-destination market dynamics in the country-destination-year dataset, and of firm-sector-destination market dynamics in the country-sector-destination-year dataset that we use in the paper we consider the following definitions:

- $Exporter_t$: any firm that exports in year t;
- $Entrant_t$: a firm that does not export in year t-1 but exports in year t;
- $Exiter_t$: a firm that exports in year t-1 but does not export in year t;
- $Incumbent_t$: a firm that exports in both years t-1 and t;
- $Survivor_t$: a firm that does not export in year t-1 but exports in both years t and t+1.

The measures of dynamics are defined as follows:

- Firm Entry $Rate_t$ = Number of $Entrants_t$ / Number of $Exporters_t$;
- Firm Exit $Rate_t$ = Number of $Exiters_t$/ Number of $Exporters_{t-1}$;
- Firm Survival $Rate_t$ = N. $Survivors_t$ / N. $Entrants_t$.

[45] The Appendix in Cebeci et al. (2012) provides detailed results on these comparisons.

[46] Although both sources of trade data, COMTRADE as well as the exporter-level raw datasets that we use, originate from customs authorities, we are aware of potential difficulties in the processing of the exporter-level raw datasets that may justify the differences sometimes observed between the export totals obtained from the exporter-level raw datasets and the export totals available in COMTRADE. One of the potential reasons for these difficulties relates to the manual registration of export transactions that still takes place in some countries and may result in under-recording of export transactions for some countries and years.

[47] For countries such as Macedonia for which the match with export totals in COMTRADE in the first few sample years is relatively poor, the match improves over time and this is likely due to a shift from manual to digital registration of export transactions.

[48] For such cells the number of exporters shows a value of 1 and most measures except those based on exiter firms in Appendix Table 1 are missing. The developed countries in our sample applied their own confidentiality rules (often stricter) as detailed in Cebeci et al. (2012). A file with the percentage of total exports corresponding to the hidden values by country and year, for the developing countries for which we have the raw exporter-level data is available from the authors upon request.

Appendix 2

Table A2.1 Average Exporter Size and Country Characteristics - Sample of Continuing Exporters

	Country-Sector Regressions	Country-Destination Regressions	Country-Sector-Destination Regressions
	Ln Mean Exports per Continuing Exporter	Ln Mean Exports per Continuing Exporter	Ln Mean Exports per Continuing Exporter
	(1)	(2)	(3)
Ln GDPpc	0.381***	0.174**	0.209***
	(0.124)	(0.066)	(0.056)
Ln GDP	0.470***	0.301***	0.339***
	(0.087)	(0.050)	(0.052)
Ln Distance		-0.365***	-0.497***
		(0.064)	(0.076)
Contiguity		0.506***	0.357***
		(0.184)	(0.074)
Common language		0.221**	0.137
		(0.088)	(0.128)
Common colonizer		0.220*	0.234
		(0.125)	(0.161)
Sector Fixed Effects	Yes		
Destination Fixed Effects		Yes	
Sector-Destination Fixed Effects			Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	12,704	16,438	219,538
R-squared	0.388	0.305	0.403

Notes: Robust standard errors in parentheses, clustered at the country level. *** and ** indicate significance at 1% and 5% confidence levels, respectively. The regression in column (1) is based on measures at the country-sector-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level); that in column (2) is based on measures at the country-destination-year level for years 2004-2008 (Brazil and New Zealand are excluded due to the lack of measures at that level), and those in column (3) are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data in the 2004-2008 period.

Table A2.2: Export-Sector Characteristics and Dynamics and Country Characteristics with More Stringent Fixed Effects

Panel A. Characteristics - Country-Sector-Destination Regressions

	Country-Sector-Destination Regressions				Country-Sector-Destination Regressions				Country-Sector-Destination Regressions				Country-Sector-Destination Regressions			
	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters	Ln Total Exports	Ln Number of Exporters	Ln Mean Exports per Exporter	Share of Top 5% Exporters
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Ln GDPpc	0.384***	0.180*	0.205***	0.020*	0.381***	0.177*	0.204***	0.020*	0.384***	0.178*	0.206***	0.020*	0.403***	0.191*	0.213***	0.021*
	(0.116)	(0.096)	(0.061)	(0.011)	(0.115)	(0.096)	(0.060)	(0.011)	(0.116)	(0.096)	(0.060)	(0.011)	(0.127)	(0.102)	(0.066)	(0.012)
Ln GDP	0.738***	0.424***	0.314***	0.031***	0.737***	0.426***	0.311***	0.032***	0.737***	0.426***	0.311***	0.032***	0.814***	0.465***	0.349***	0.035***
	(0.101)	(0.072)	(0.059)	(0.006)	(0.101)	(0.072)	(0.058)	(0.006)	(0.101)	(0.072)	(0.058)	(0.006)	(0.108)	(0.080)	(0.059)	(0.007)
Sector-Year Fixed Effects	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes				
Destination Fixed Effects	Yes	Yes	Yes	Yes												
Destination-Year Fixed Effects					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Sector Fixed Effects					Yes	Yes	Yes	Yes								
Sector-Destination-Year Fixed Effects													Yes	Yes	Yes	Yes
Observations	289,954	289,954	289,954	64,018	289,954	289,954	289,954	64,018	289,954	289,954	289,954	64,018	289,954	289,954	289,954	64,018
R-squared	0.341	0.422	0.280	0.270	0.342	0.425	0.281	0.272	0.344	0.426	0.283	0.276	0.513	0.535	0.478	0.584

Panel B. Dynamics - Country-Sector-Destination Regressions

	Country-Sector-Destination Regressions					Country-Sector-Destination Regressions					Country-Sector-Destination Regressions					Country-Sector-Destination Regressions				
	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate	Entry Rate	Exit Rate	Entrant Survival Rate	Net Entry Rate	Turnover Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Ln GDPpc	-0.051***	-0.052***	0.023**	0.000	-0.089***	-0.051***	-0.052***	0.024**	0.000	-0.089***	-0.051***	-0.052***	0.024**	0.000	-0.089***	-0.051***	-0.052***	0.023**	0.000	-0.087***
	(0.009)	(0.010)	(0.010)	(0.002)	(0.020)	(0.009)	(0.010)	(0.010)	(0.002)	(0.020)	(0.009)	(0.010)	(0.010)	(0.002)	(0.020)	(0.010)	(0.011)	(0.010)	(0.002)	(0.021)
Ln GDP	-0.011	-0.012*	0.012***	0.004	0.056***	-0.010	-0.012*	0.012***	0.003	0.057***	-0.010	-0.012*	0.012***	0.003	0.057***	-0.012*	-0.014**	0.014***	0.004	0.050***
	(0.006)	(0.006)	(0.004)	(0.003)	(0.015)	(0.006)	(0.006)	(0.004)	(0.003)	(0.015)	(0.006)	(0.006)	(0.004)	(0.003)	(0.015)	(0.007)	(0.006)	(0.004)	(0.003)	(0.016)
Sector-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes					
Destination Fixed Effects	Yes	Yes	Yes	Yes	Yes															
Destination-Year Fixed Effects						Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Sector Fixed Effects						Yes	Yes	Yes	Yes	Yes										
Sector-Destination-Year Fixed Effects																Yes	Yes	Yes	Yes	Yes
Observations	428,415	418,408	352,292	338,733	338,733	428,415	418,408	352,292	338,733	338,733	428,415	418,408	352,292	338,733	338,733	428,415	418,408	352,292	338,733	338,733
R-squared	0.093	0.093	0.050	0.008	0.122	0.097	0.096	0.054	0.014	0.126	0.099	0.098	0.056	0.016	0.128	0.288	0.290	0.281	0.237	0.338

Notes: Robust standard errors in parentheses, clustered at the country level. ***, **, and * indicate significance at 1%, 5%, and 10% confidence levels, respectively. The regressions are based on measures at the country-sector-destination-year level for years 2004-2008 for the 34 developing countries for which we have access to the raw exporter-level data (the list is provided in Table 1) as well as Norway, Portugal, and Spain. Kuwait is excluded from all regressions due to lack of data for the 2004-2008 period. All regressions control also for distance, contiguity, common language, and common colonizer. The estimating sample for the regressions in columns (1)-(3), (5)-(7), (9)-(11), and (13)-(15) of Panel A excludes observations whose corresponding number of exporters is equal to 1 while that for the regressions in columns (4), (8), (12), and (16) of Panel A excludes observations whose corresponding number of exporters is smaller than 20.