Journal of Development Economics 119 (2016) 121–137

Contents lists available at ScienceDirect

Journal of Development Economics

journal homepage: www.elsevier.com/locate/devec

Regular Article

Exporter behavior, country size and stage of development: Evidence from the exporter dynamics database☆

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ARTICLE INFO

Article history:
Received 17 December 2014
Received in revised form 8 October 2015
Accepted 15 October 2015
Available online 2 November 2015

JEL classification:
F14
O1

Keywords:
Exporter dynamics
Exporter growth
Firm-level data
Allocative efficiency

ABSTRACT

We present new data on the micro-structure of the export sector for 45 countries and study 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%. 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. We discuss the results in light of trade theories with heterogeneous firms and the empirical literature on resource allocation, firm size, and development. An implication from our findings is that developing countries export less because the top of the firm-size distribution is truncated.

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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% 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

☆ The authors would like to thank the 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 (P130883) research support budget and the Knowledge for Change Program (KCP; TF012590), 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 their many useful comments and discussions. We thank the 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 their 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. The findings expressed in this paper are those of the authors and do not necessarily represent the views of the World Bank.

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http://dx.doi.org/10.1016/j.jdeveco.2015.10.007
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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 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 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 (Alfaro et al., 2009; Tybout, 2000, 2014). In contrast, if the high-productivity firms are the most constrained and fail to invest (Bento and Restuccia, 2014; Hsieh and Klenow, 2009; Hsieh and Olken, 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% 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 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

[1] See Eaton et al. (2008b) for France; Eaton et al. (2008a) for Colombia; Amador and Opromolla (2013) for Portugal; Iacovone and Javorcik (2010) for Mexico; Andersson et al. (2008) for Sweden, Albornoz et al. (2012) for Argentina; Freund and Pierola (2010) for Peru; Manova and Zhang (2012) for China, Masso and Vahter (2015) for Estonia, De Lucio et al. (2011) for Spain, Ekholm et al. (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.

[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 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 of 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.

[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 the coverage of the Database.

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