Journal of Development Economics 121 (2016) 177–189

Contents lists available at ScienceDirect

Journal of Development Economics

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

Unexceptional exporter performance in China? The role of processing trade

Mi Dai [a], Madhura Maitra [b], Miaojie Yu [c,*]

[a] Business School, Beijing Normal University, China
[b] PricewaterhouseCoopers, United States
[c] China Center for Economic Research (CCER), National School of Development, Peking University, China

ARTICLE INFO

Article history:
Received 8 November 2014
Received in revised form 27 February 2016
Accepted 18 March 2016
Available online 8 April 2016

JEL classification:
F1 O1

Keywords:
Processing trade
Firm productivity
Export

ABSTRACT

The firm level trade literature finds that exporters are exceptional performers for a wide range of countries and measures. Paradoxically, the one documented exception is the world's largest exporter, China. We show that this puzzling finding is entirely driven by firms that engage only in export processing — the activity of assembling tariff exempted imported inputs into final goods for resale in the foreign markets. We find that processing exporters are less productive than non-processing exporters and non-exporters, and have inferior performance in many other aspects such as profitability, wages, R&D and skill intensity. Accounting for processing exporters explains the abnormality in exporter performance in China documented in the previous literature. Low fixed costs of processing exporting, as well as the trade and industrial policies favoring processing exporters are both responsible for the low productivity of processing exporters. Our analysis suggests that distinguishing between processing and non-processing exporters is crucial for understanding firm-level exporting behavior in China. It also provides caveats in analyzing the exporter performance in other developing countries that are highly integrated into the global value chains.

1. Introduction

The nature of international trade has changed — as Grossman and Rossi-Hansberg (2006) put it: It's not wine for cloth anymore. In the modern world, with rapid progress of communication and technology, production processes increasingly involve global value chains (henceforth GVCs) spanning multiple countries, with different stages of the production taking place in several disparate locations. A particular form of this fragmented production technique is processing trade: the activity of assembling tariffs exempted imported inputs into final goods for resale in the foreign markets. The iPhone is a classic example: the different components of an iPhone are manufactured in Japan, Korea, Germany, US, and Taiwan from where these are shipped to China for the final assembly at Foxconn, an exclusive iPhone assembler located in Shenzhen, China. All final assembled products are exported back to the US and other markets. In terms of its sheer magnitude processing trade in China merits special attention. Processing trade accounts for nearly half of China's exports, exceeding total exports for most countries except Germany and USA. Processing/assembly has become popular in other developing countries as well. In 2006, 130 countries had established 3500 Export Processing Zones (EPZs), which employed 66 million people in total. For many countries (Kenya, Malaysia, Argentina, etc.), exports from EPZs accounted for over 80% of their total exports.

To the best of our knowledge, this paper is one of the first to study the performance of processing firms vis-a-vis non-processing ones. Using a comprehensive firm-level data that matches balance-sheet information with trade information by detailed trade regime, we demonstrate that processing exporters in China are very different from the traditional exporters in that they do not exhibit the exceptional performance of exporters as documented for a wide range of countries and measures. We also show that accounting for this difference is crucial. In fact, if all exporters are treated the same in China, a puzzling result emerges: contrary to the accumulated evidence in the literature, exporters are no longer superior performers.[1] We show that these puzzling findings are largely driven by firms purely engaged in processing trade, whereas other types of firms have the usual superior performance.

We first systematically document the performance of processing exporters. Our main findings are as follows. First, processing exporters are less productive than both non-processing exporters and non-exporters. Second, processing exporters are special in other aspects as well. These firms have lower profitability, pay lower wages, are relatively smaller in terms of sales, have lower capital intensity, invest less in R&D, and are less skill intensive. Finally, it is crucial to account for processing exporters separately, since failing to do so make all exporters

* Corresponding author.
E-mail addresses: daimi002@gmail.com (M. Dai), modhura.m@gmail.com (M. Maitra), mjyu@nsd.pku.edu.cn (M. Yu).

[1] That exporters in China are less productive than non-exporters have been documented in Lu et al. (2010) and Lu (2010).

http://dx.doi.org/10.1016/j.jdeveco.2016.03.007
0304-3878/

appear less productive than non-exporters — even though non-processing exporters' performance is similar to what has been widely documented in the literature. Henceforth, studies of export performance in China (or countries with large processing trade sectors such as Mexico and Vietnam) should account for the distinction between processing and non-processing sectors.

We next investigate why processing exporters are less productive. We propose a selection mechanism rationalizing the lower productivity of processing exporters over non-processing ones. Firms trade-off the benefits and costs of different trade modes. Compared with non-processing trade, processing trade mainly has two benefits. First, it is associated with lower fixed costs of exporting because the exporting costs in distribution, marketing, and R&D are shared by the foreign buyer. Second, the trade and industrial policies favoring processing trade, such as exemptions of input tariffs and reductions of corporate income tax rates, further reduced the costs of doing processing. However, processing trade is also associated with additional costs. Since processing firms generally contribute less than non-processing firms to the value of the final good, they have to share a larger proportion of profits with other producers. Under this framework, firms with different productivity will optimally sort into different trade modes. Less productive firms will select into processing exporting because the benefits of lower fixed costs outweigh the costs of profit sharing, while for more productive firms, the vice versa is true so they select into non-processing.

Empirically, we find that the low fixed costs of exporting, as well as the trade and industrial policies favoring processing trade, are both responsible for the low productivity of processing exporters. For the role of the fixed costs of exporting, we find that processing exporters are particularly less productive in industries that are intensive in distribution, advertising, and R&D-elements which are usually thought to be the important components of the fixed costs of exporting. We also find that the productivity of firms doing pure assembly (which arguably has lower fixed costs of exporting than PWIM because of its passive role in obtaining materials and searching for clients) is lower than firms doing PWIM. For the role of trade and industrial policies, we find input tariffs exemptions and income tax benefits both matter. First, the relative productivity of processing exporters are lower in the sectors where the benefits of input tariffs exemptions are larger. Second, processing firms that are eligible for the income tax benefits granted to export-oriented firms have particularly low productivity. Also, controlling for eligibility to the tax benefits reduces the productivity disadvantage of processing exporters to a large extent.

Our analysis provides a significant caveat in analyzing the exporter performance in countries that are highly integrated into the GVCs. It highlights the fact that the connection between trade, productivity and other firm outcomes within GVCs is likely to be complex, especially when the integration into the global production network is accompanied with discriminative trade and industrial policies. It also underscores the importance of a firm's place and role within a GVC as a potential determinant of its productivity and other performances. It is important to note that we are not aware of any studies that investigate the performance of processing trade firms in countries other than China, so it is yet to be established whether the unexceptional performance of processing firms found in the Chinese data is generalizable to other developing countries as well. For other developing countries interested in increasing GVC participation and learning from China's experience, it will thus be important for future research to examine whether processing trade generally has these kinds of implications.

Our paper is related to the firm level trade literature analyzing the behavior of exporters. Papers like Bernard and Jensen (1995, 1999, 2004); Bernard and Wagner (1997); Clerides et al. (1998); Aw et al. (2000); Pavcnik (2002); Greenaway and Kneller (2004); Blalock and Gertler (2004); Van Biesebroeck (2005), and De De Loecker (2007); to name a few, find that exporters are more productive than non-exporters for a wide range of countries. Two recent papers, however, find the opposite result for China — exporters being less productive than non-exporters. The paper, by Lu et al. (2010), shows that the anomalous result is true only for exporters that are foreign-owned-firms. Another paper, by Lu (2010), finds that exporters are less productive than non-exporters only in labor intensive sectors. In this paper we match the firm level data used in the two prior works to the Chinese customs trade data.[2] The use of merged data allows us to identify a firm's processing status and uncover new systematic patterns about how firms' productivity vary with processing status.

This paper is also related to the literature studying global value chains. Though many papers, both theory and empirical, have studied international vertical specialization and GVCs (Feenstra and Hanson, 1996, 1999, 2005; Hummels et al., 1998; Hummels et al., 2001; Yi, 2003; Hanson et al., 2005; Grossman and Rossi-Hansberg, 2008; Costinot et al., 2013; Johnson and Noguera, 2012, etc.), none of these papers have investigated the firms along the GVCs from a developing country's point of view. The present paper aims to fill this gap.

Lastly, there is an emerging literature documenting the special features and implications of processing trade. At the micro level, recent studies have revealed interesting patterns of processing exporters, including vertical integration (Fernandes and Tang, 2012), product scope (Fernandes and Tang, 2015), and exporting dynamics (Fernandes and Tang, 2015). At the macro level, studies have found that processing trade is associated with aggregate consequences. Bergin et al. (2011) show that industries that are more involved in processing trade are associated with higher volatility. Defever and Riaño (2014) show that subsidies towards processing exporters leads to domestic welfare loss. Finally, processing trade is shown to be important in understanding value-added trade. Koopman et al. (2012) shows that using traditional methods for calculating value added for countries that actively engage in processing trade can overestimate the domestic content of these countries' exports. Kee and Tang (forthcoming) studies the patterns and determinants of domestic value-added of Chinese processing exporters. Our paper is distinct from these studies as we focus on processing trade and productivity. We show that processing exporters are less productive, and accounting for this special feature of processing exporters has important implications in understanding the link between trade and productivity in general.

The paper is organized as follows. Section 2 briefly introduces China's export processing regime. Section 3 describes the data. Section 4 provides several stylized facts about processing exporters in China and relates them to the productivity abnormality documented about Chinese exporters. Section 5 offers possible interpretations about processing exporters' unexceptional performance and how well they are supported by the data, and discusses the dynamics of processing status. The last section concludes.

2. Introduction of China's export-processing regime

The Chinese government has been actively promoting processing trade since the 1980s in order to stimulate exports. Processing trade is defined as "business activities in which the operating enterprise imports all or part of the raw or ancillary materials, spare parts, components, and packaging materials, and re-exports finished products after processing or assembling these materials/parts".[3] Compared with non-processing trade (which is also usually referred to as "ordinary trade"), processing trade involves several notable characteristics. First, processing trade is heavily dependent on importing intermediate inputs. A large proportion of parts and components, especially those embed sophisticated

[2] The firm level data does not provide any information about the firms' processing status. This information is available from the customs data; hence using the merged data is crucial.

[3] The definition is taken from "Measures of the Customs of the People's Republic of China on the Control of Processing-Trade Goods", which is released in 2004 and amended in 2008 and 2010.