



Do domestic and foreign exporters differ in learning by exporting? Evidence from China

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ABSTRACT

In view of the importance of intra-firm trade and export-platform FDI conducted by multinationals, we investigate how domestic firms and foreign affiliates exhibited differential impacts of export entry and exit on productivity changes. Using a comprehensive dataset from China's manufacturing industries, we employ the Olley–Pakes method to estimate firm-level TFP and the matching techniques to isolate the impacts of export participation on firm productivity. Robust evidence is obtained that domestic firms displayed significant productivity gains (losses) upon export entry (exit), whereas foreign affiliates showed no evident TFP changes. Moreover, the productivity gains for domestic export starters were more pronounced in high- and medium-technology industries than in low-technology ones. We explain our findings from the perspective of the technology gap theory after considering processing trade and the fragmentation of production stages in the era of globalization.

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1. Introduction

Governments of many developing countries have actively pursued export-oriented industrialization policies by encouraging their manufacturing firms to export to international markets. International organizations such as United Nations and World Bank have also advised developing countries to adopt export-oriented development strategies (United Nation Trade and Investment Division, 2001; World Bank, 1987). Such policy orientation is based on the observation that exporters are more productive than non-exporters. It is believed that exporting opens up large international markets to allow firms to achieve economies of scale, and exporters with access to world markets could observe and adopt new technologies to accelerate their productivity improvement. In short, export promotion policies are predicated on the belief that exporting enhances firm productivity. Albeit a reasonable expectation, the empirical evidence is rather mixed and inconclusive. By conducting cross-country analysis, World Bank (1993) finds that both income growth and factor productivity growth display a significant positive correlation with the share of manufactured exports in a country's total exports or gross domestic product, but leaves the direction of causality unsolved. Subsequently, a slew of studies using firm-level data find much support for self-selection, i.e., they find that exporters are more productive ex ante than non-exporters (e.g., Bernard & Jensen, 1995, 1999), which has now become part of stylized facts. In contrast, the evidence of improving productivity from exporting, i.e., learning by exporting, is much weaker. More recent studies have investigated the impacts of exporting on firm productivity by attempting to control for the self-selection problem using GMM or matching techniques. Their findings have lent support to learning by exporting, especially in transitional and

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developing countries (e.g., Blalock & Gertler, 2004, for the case of Indonesia; Van Biesebroeck, 2005, for the case of nine sub-Saharan African countries; De Loecker, 2007, for the case of Slovenia; Trofimenko, 2008, and Fernandes & Isgut, 2009, for the case of Colombia; Ma & Zhang, 2008, and Yang & Mallick, 2010, for the case of China).¹

While some earlier studies found that learning by exporting is specific to newly established firms (e.g., Delgado, Farinas, & Ruano, 2002), firms highly exposed to export markets (e.g., Girma, Görg, & Strobl, 2004), and firms engaged in industries with low exposure to foreign firms through international trade and FDI (Greenaway & Kneller, 2008), little attention has been paid to the distinction between domestic firms and foreign affiliates (i.e., foreign-invested firms operating in developing countries) among exporters. Built upon a combination of sunk costs and firm heterogeneity, the prevailing theoretical and empirical literature (e.g., Bernard, Eaton, Jensen, & Kortum, 2003; Bernard & Jensen, 1995; Helpman, Melitz, & Yeaple, 2004; Melitz, 2003) primarily emphasizes the *ex ante* distinction between exporters and non-exporters in terms of various characteristics like firm size, productivity, etc. As a result, exporters are mainly treated as a whole without due attention to the heterogeneity in the characteristics of exporters, particularly between domestic and foreign-invested exporters.²

In this study, we extend the examination of firm heterogeneity between exporters and non-exporters to that between domestic firms and foreign affiliates within the category of exporters in the context of developing countries. This extension is meaningful, particularly for developing economies, because of the rising popularity of intra-firm trade and export platform foreign direct investment (FDI) conducted by multinational corporations (Greenaway & Kneller, 2007). It is widely documented that along with the trend of globalization, multinationals have increasingly set up their production plants in low-cost countries such as Brazil, China, India, and Russia as their export platforms. As a result, a significant percentage of export from those low-cost countries is made by foreign affiliates in the countries. Does the impact of exporting on firm productivity differ for domestic firms as compared with foreign affiliates? This is an important question that is instrumental to our understanding of the effects of exporting on productivity. Moreover, the possible performance differences between domestic firms and foreign affiliates in the post-exporting periods could have profound policy implications in the era of globalization when governments of developing countries strive to maintain as much economic sovereignty as possible in the face of the growing prowess of multinationals. Given that the export-oriented industrialization policy is built upon the hope that exporting enhances the productivity of indigenous firms, it is essential to analyze the potentially different effects of exporting on domestic firms and foreign affiliates. This study tries to fill in the void by using a large sample of data from China's manufacturing firms for the period of 1998–2005.

China offers an ideal setting to investigate learning by exporting and the possible differential impacts of exporting on firm productivity between domestic firms and foreign affiliates. Firstly, China is a fast-growing developing country with its exports rising from a meager amount of 18 billion dollars or less than 4% of its GDP in 1980 to more than 760 billion dollars or over 36% of its GDP in 2005 (Wang & Wei, 2007), and has become the largest exporting country in the world in 2010 (Lin, 2010). It is widely agreed that exporting has been an important engine of China's economic growth in the past three decades. Although the rapid growth in both aggregate output and trade implies dramatic learning by exporting among firms in China, more detailed firm-level analysis is needed to detect the positive impacts of exporting on firm productivity. Secondly, China has attracted more than US\$1285 billion FDI (China Statistical Yearbook, 2006) between 1979 and 2005, but much of China's export has been made by foreign affiliates, not China's domestic firms (Manova & Zhang, 2008). Foreign affiliates and domestic firms are usually shown to display substantial differences in exporting behavior (Kneller & Pisu, 2004; Lu, Lu & Tao, 2010). Thus, it is important to analyze the differential impacts of exporting on productivity of domestic firms and foreign affiliates in China. Because whether it is domestic firms or foreign affiliates that benefited most from exporting in productivity is not only of academic interest that helps us understand the heterogeneity in the consequences of exporting but also of central importance to assessing the effectiveness of export promotion policies in developing countries.

Our dataset comes from annual surveys of manufacturing firms conducted by the *National Bureau of Statistics of China* for the period of 1998 to 2005. In measuring firm-level total factor productivity (TFP), we employ Olley–Pakes (OP) method and its variants (De Loecker, 2007; De Loecker, 2010; Klette & Griliches, 1996) to deal with the potential endogeneity issues addressed in these methods. Consistent with the literature, we find that there is self-selection in the exporting decision. In particular, it is found that among the domestic firms the more productive firms are more likely to become exporters, whereas the opposite holds for the foreign affiliates (Lu, Lu, & Tao, 2010). To isolate the impacts of exporting on firm productivity, we follow the recent literature such as De Loecker (2007) and Greenaway and Kneller (2008) to use the propensity score matching method to select control group firms. In particular, we use the nearest neighbor matching and the stratification matching methods to match new exporters with those non-exporters having similar pre-entry characteristics but remaining non-exporting. Albeit imperfect as discussed later, the propensity score method is still the most updated approach and is widely used in the literature.

We find that domestic firms displayed significant immediate productivity gains upon entering export markets and steadily widening cumulative productivity gains if they continued to export in the subsequent years. The TFP level of domestic export starters increased by 0.8–1.9 percentage points in the year when they began to export. This TFP premium for domestic exporters

¹ Studies using data from developed countries include Girma et al. (2004) and Greenaway and Kneller (2008) for UK, Serti and Tomasi (2008) for Italy, and Hahn and Park (2009) for South Korea, etc. See Greenaway and Kneller (2007) and Wagner (2007) for a survey of the relevant literature.

² It is worth noting that Baldwin and Gu (2003) differentiated exporters by their ownership nature. Their findings reveal that in Canadian manufacturing industries, domestic-controlled new exporters enjoyed faster growth in productivity than foreign-controlled ones. Whereas they mainly used labor productivity in their study, we employ in this paper the latest measures of TFP which has many advantages. Furthermore, we address the differences between domestic and foreign affiliate exporters in a developing country where the differences between the two are expected to be more striking. Greenaway and Kneller (2008) further addressed this issue and emphasized that foreign-owned firms significantly differ from domestic firms in their determinants of export market entry and export intensity.

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