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Export Market Diversification and Firm Productivity: Evidence from a Large Developing Country

QIAN XUEFENG [a] and MAHMUT YAşAR [b,c,*]

[a] *Zhongnan University of Economics and Law, Wuhan, PR China*
[b] *University of Texas at Arlington, USA*
[c] *Emory University, USA*

Summary. — This paper first provides information on the distribution of Chinese firms' export destinations. It then examines the relationship between firms' export market diversification and their productivity by using trade and production data from the *Customs Trade Statistics* and the *Annual Survey of Industrial Firms in China* from the years 2000 to 2006. We check the robustness of the results by controlling for potential endogeneity and estimating various specifications. We find that there is a U-shaped relationship between the diversification of export markets and firm productivity. As firms begin to export, they face higher costs (and thus lower productivity) initially because they lack the knowledge and experience. Eventually, as diversification of the export market moves beyond a threshold level and investments cumulate, export market expansion results in lower long-run average costs and thus higher productivity owing to the learning curve and economies of scope, as well as economies of scale. This U-shaped relationship, however, is less pronounced for firms with higher share of intermediate products in total exports, for firms engaged in processing trade, and for firms exporting to Hong Kong. The results have significant implications for firm export dynamics and behavior, and can help target policies that will boost the performance of the firms. They are significant for policy makers who have emphasized the importance of export diversification for mitigating the impact of global shocks.

Key words — diversification of export markets, productivity, extensive- and intensive-margins of trade, economies of scope, learning

1. INTRODUCTION

During the last several decades, as the cost of transportation and telecommunications across national borders has decreased and the world has shifted toward freer trade, [1] policy makers (in both developing and developed countries) have encouraged domestic firms to expand their export destinations, with the anticipation that diversification of export sales can improve the terms of trade, lower volatility, and boost economic growth (Beverellia, Neumuellerb, & Teha, 2015; Cadot, Carrère, & Strauss-Kahn, 2011; Feinberg, 1992; Haddad, Lim, & Saborowski, 2010; Nicita & Rollo, 2015; Shepherd, 2010; Szekely, 1989). [2] For example, every "Five-Year Plan" in China since 1986 has highlighted "opening up overseas emerging markets and promoting the diversification of export markets" as a significant channel for expanding and stabilizing external demand. The findings of some macro-level studies support these policy efforts (e.g., Haddad *et al.*, 2010; Huang & Zhou, 2011; Qian & Xiong, 2010). [3] The intuition is that with a higher degree of export diversification, idiosyncratic shocks are less likely to have a significant impact on a country's terms of trade, which can result in less fluctuation in a country's growth. [4] In addition, "a higher degree of diversification would likely imply that a country is involved in a larger number of both implicit and explicit international insurance schemes, which would similarly serve as a cushion against such fluctuations" (Haddad *et al.*, 2010).

Despite these recognitions and findings at the macro level, knowing more about what motivates individual firms to diversify their exports across products and destinations would be useful. Recent studies suggest that an analysis of export market diversification at the firm or sector, rather than country, level can be more informative for understanding whether export market expansion is effective and how policies may influence it. [5] Feinberg (1992), for instance, examined the relationship between the distribution of exports by country of destination and the exchange rate movements using data on US industries from 1978 to 1987, and found that the dollar appreciations (and depreciations) lead to increased (and decreased) export concentration. [6,7] By using Chinese firm-level data from 2003 to 2005, Manova and Zhang (2012) examined price differences across firms, products, and trade partners and documented that better-performing exporters use higher-quality inputs and produce higher-quality goods and that the quality of the products that firms offer differs across export markets with different market size, income, distance, and overall remoteness. [8] Eaton, Kortum, and Kramarz (2011) extended the models of firm heterogeneity and exporting (e.g., Chaney, 2008; Melitz, 2003) by accounting for the market- and firm-specific heterogeneity in entry cost and demand to provide a better understanding of the barriers to firms' exporting activities that stem from "iceberg" trade barriers and fixed exportation costs (Bernard, Jensen, Kortum, & Eaton, 2003; Eaton, Kortum, & Kramarz, 2004; Melitz, 2003; Roberts & Tybout, 1997). By estimating a structural model using firm-level French data, they show that fixed costs squander 59% of gross firm profit in any destination. These intriguing results also reveal significant variations in a firm's sales across destinations and high variations in sales in a given market. [9] Eaton, Eslava, Kugler, and Tybout (2008) concluded that

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market size, distances, learning processes, and regional differences in the demanded mix of products can affect the outcome of the export expansion process. They showed that there is high entry of Colombian exporters into the export markets, but most of these entrants have a very small export share and exit the market within a year. Some firms, however, succeed in these markets and gradually break into other export destinations. As illustrated in Section 3 of this paper, Chinese firms exhibit similar patterns.

Accordingly, the question of whether and to what extent geographic exports expansion or export sales diversification will affect firm performance is a crucial one, especially for firms in developing countries, whose policy makers expect firms to expand export destinations through various means in order to mitigate these countries' vulnerability to global shocks. Is the relationship between the export market diversification and firm productivity linear or nonlinear? If nonlinear, at what level of diversification do the firms' performances reach the minimum and start to increase thereafter? What should firms that lie to the left of the turning point do in order to reach the optimal level of export market destinations? We will provide some answers to these questions by examining the impact of the diversification of exports sales on firms' performances using analysis of Chinese manufacturing firms.

Export expansion is expected to improve firms' productivity if they can adjust successfully to new markets by developing customized products and promotional activities that meet local tastes, by managing their strategies and operations to accommodate business relations/practices and environmental and labor market practices, and by adhering to local laws and regulations (Czinkota, Ronkainen, & Moffett, 2010; Seyoum, 2014). These firms are expected to increase the market for their goods, reduce the average cost of production, minimize risks (such as the exchange rate and political risks), and take advantage of the expected future growth in some of the emerging markets in the early stages of liberalization. [10] This relationship, however, may not be linear. In this study, we build on *learning theories* and a model of multiproduct firms and hypothesize that the relationship between export market diversification and firm productivity is U-shaped rather than linear. We expect that as export market diversification increases, productivity declines to a threshold point and increases thereafter as firms improve their abilities to make cost-saving and productivity-enhancing business decisions. The firms, especially those from developing countries, "lack both the familiarity with consumer values in industrialized countries and expertise in M&D [marketing and distribution] activities" (Gray, 1999, p. 120). As highlighted by Eaton, Eslava, Kugler, and Tybout (2007), firms choose certain markets in their home region as "testing grounds" to learn about and improve their foreign market capabilities, and if they succeed in these markets, they then begin to test their capabilities in larger, more advanced countries. Initially, as firms expand, the costs of expansion can erode the economies of scale achieved through the firms' foreign market involvement. By expanding, firms bear production and transaction costs associated with "market entry cost related to product modification, legal representation, and advertising, as well as the development of an agent/distributer network" (Seyoum, 2014). Because of lack of knowledge about and experience needed to accommodate local tastes, business and labor market practices, and government regulations in these new markets, these costs can initially be substantial (Czinkota *et al*., 2010). However, it is expected that the expansion will eventually yield lower long-run average costs and thus higher productivity as a result of economies of scale, economies of scope, and the learning curve. [11]

To test our hypothesis, we utilize firm-level Chinese data from Chinese Customs Trade Statistics (CCTS) and the Annual Survey of Industrial Firms (CASIF) from 2000 to 2006. As a proxy for performance, we use a variable that has been considered as the main determinant of firm survival and growth, namely firm productivity (Lichtenberg & Siegel, 1990). Thus, we first compute robust measures of these firms' total factor productivity by using a technique developed by Wooldridge (2009) that integrates and improves the methods proposed by Olley and Pakes (1996) and Levinsohn and Petrin (2003) by emphasizing the issues highlighted by Ackerberg, Caves, and Frazer (2006). In allowing us to control for the endogeneity bias that arises from the potential correlation between firm productivity and inputs utilized, this approach results in robust productivity measures. This article thus contributes to the literature as the first paper (to the best of our knowledge) that explicitly investigates the productive impact of export diversification using Chinese firm-level data. Our empirical analysis uses a variety of specifications and robustness checks. We estimate our model using ordinary least squares (OLS), controlling for firm heterogeneity, and using an instrumental variable (IV) estimator that also controls for the potential endogeneity of the main variables of interest. Furthermore, to check the robustness of our results, we use different proxies for firm performance and export sales diversification.

Before testing our hypothesis, we follow the previous studies (Bernard, Jensen, & Schott, 2006; Eaton *et al*., 2004, 2008; Eckel & Neary, 2010; Lawless, 2009; Mayer *et al*., 2014), and review the patterns in the data. We find that the Chinese firms' behavior in the export markets is also highly heterogeneous. The summary statistics indicate that 19.69% of exporters serve only one market, 54.74% serve five or fewer markets, and only 18.01% serve 15 or more markets. The privately owned firms export to more destinations than the state-owned and foreign-owned firms. About 46%, 41%, and 48% of state-owned, foreign-owned, and privately owned firms serve more than five markets, respectively. Similarly, only about 15% of small firms export to more than 10 destinations, while about 24% of medium-sized firms and 39% of large firms export to more than 10 markets. Consistent with previous studies (Eckel & Neary, 2010; Lawless, 2009; Mayer *et al*., 2014), we also find that firms exporting to multiple markets have higher productivity levels and growth rates. Furthermore, we find that many firms enter and exit an export market every year, indicating that firms can break into export markets, but some are not efficient enough to survive.

We next test our hypothesis and find a convex, U-shaped relationship between the two measures of firm performance, labor productivity and total factor productivity, and the export sales diversification of the firms. The parameter estimates become even more pronounced after accommodating the potential endogeneity of variables that proxy the exports sales diversification via instrumental variable estimation. The results suggest that at initially lower levels of export sales diversification, a further increase in diversification reduces the productivity of the firm; but after a certain threshold of diversification, the productive impact becomes positive. More specifically, our results indicate that when the diversification index is about 0.49 or higher, export market diversification enhances productivity. The U-shaped relationship between productivity and diversification of export markets, however, is less pronounced for firms with higher share of intermediate products in total exports, for firms engaged in processing