



# Multinational price premium<sup>☆</sup>

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## ABSTRACT

By exploring a rich data set that links international trade transactions to panel data of manufacturing firms from China during 2000–2006, we reveal new patterns of export prices across firms. We find that foreign firms charge about 28% higher prices than Chinese exporters after controls for firm productivity and product–destination–year fixed effects. We provide evidence that the multinational price premium is significantly correlated with the knowledge-based intangible assets within multinationals. The multinational price premium is substantially higher for firms with headquarters in more innovative countries and for firms that have technicians and managers sent from their parent companies. The price premium is even higher for majority- or wholly owned affiliates than for minority-owned affiliates. Our results imply that in addition to generating efficiency gains, multinationals can also enhance the capability of foreign affiliates to produce quality.

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## 1. Introduction

Multinational firms play an important role in transferring advanced technology from industrialized countries to the developing world. Studies on foreign direct investment (FDI) in developing countries document substantial productivity gains from FDI and various channels of productivity spillovers from multinational firms to domestic enterprises (e.g., see Haddad and Harrison, 1993; Aitken and Harrison, 1999; Javorcik, 2004; Markusen and Trofimenko, 2009). However, the existing FDI literature offers us little evidence for another important potential gain from FDI: technology transfer within multinationals may improve the ability of foreign affiliates to produce higher quality.

Compared to firm productivity, building a firm's capability to produce quality is considered to be an equally important element in the process of industrial development and global integration (Sutton, 2007). To compete in global markets, especially in rich markets, firms must attain

some threshold level of quality to meet foreign demands (Verhoogen, 2008). While poor productivity can always be compensated for by low labor costs, deficiencies in quality cannot be offset by low wages. Moreover, as wage rates rise, the competitive edge in low-end labor-intensive goods will erode. Therefore, moving up the value chain and being able to produce higher quality are the key to sustain industrial development and long-term economic growth.

In this paper we will investigate this important but less explored question: in addition to generating efficiency gains, can multinational firms also enhance the capability of foreign subsidiaries to produce higher quality? Our study exploits a rich data set that matches international trade transactions to panel data of manufacturing firms from China over the period 2000–2006. Multinational firms have long played an important role in promoting China's exports, accounting for more than half of China's international trade. Over 90% of these foreign firms are headquartered in technologically advanced countries. Transfer of intangible assets from parent companies constitutes an important source of advanced technology for foreign affiliates in China. In the empirical analysis we focus on the export performance of firms and use export prices to infer product quality.<sup>1</sup> We find that foreign-owned firms charge about 28% higher prices than Chinese exporters even after controlling for firm productivity and product–destination–year fixed effects. Although it is well documented that multinationals are bigger, more productive, and

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<sup>1</sup> There is a large trade literature that uses export prices to infer product quality. For example, see Schott (2004), Hummels and Klenow (2005), Hallak (2006), Hausmann et al. (2007), Khandelwal (2010), Bastos and Silva (2010), Manova and Zhang (2012), Feenstra and Romalis (2014), among others.

pay higher wages than domestic firms (see Lipsey (2004) and Barba Navaretti and Venables (2004, chap. 1) for a survey of these facts), to our knowledge, our study is the first to reveal the substantial export price differential between multinationals and domestic enterprises. The goal of this paper is to investigate the sources of the multinational price premium in order to identify the effect of FDI on quality upgrading.

To guide the empirical investigation, we follow Sutton (2007) and Hallak and Sivadasan (2009, 2013) and consider firms to be different in two dimensions: productivity and the ability to produce quality. Following Hallak and Sivadasan (2009, 2013), we assume that firms need to incur both variable and fixed costs to improve quality. More productive firms have a lower variable cost of producing quality, while firms with higher ability to produce quality incur a lower fixed cost when improving quality. Thus, firms with higher productivity and higher ability have the comparative advantage in producing quality, implying that at equilibrium they choose to produce higher quality and charge higher prices. We derive that the export price is a simple log-linear function of firm productivity, the ability to produce quality, as well as destination-specific transport costs and market size.

Because we are interested in the role of firm heterogeneity in determining the export price, we control for the demand side by including product–destination–year fixed effects. Thus, the empirical relationship between the export price and firm heterogeneity is identified using the variation of export prices and firm characteristics within the same product–destination market for the same year. Our empirical analysis pays particular attention to the role of transfer of intangible assets within multinationals in contributing to the multinational price premium. We note that the transfer of intangible assets may both improve productivity of foreign affiliates and enhance their ability to produce quality. We control for firm productivity to account for the possible channel through productivity. Hence, the partial effect of transfer of intangible assets on the export price most likely captures the effect through enhancing the ability of foreign affiliates to produce quality.

Our investigation reveals a strong relationship between the multinational price premium and the knowledge-based intangible assets within multinationals. The key findings are as follows. First, the multinational price premium is significantly higher for firms with headquarters in more innovative countries. Since most R&D by multinational firms tends to be done in the headquarters, the home country R&D intensity may capture the innovation capability of foreign investors from different countries. We find that a 1 percentage point increase in the home country R&D intensity (relative to that of China) is associated with an increase of 9.17 log points in the multinational price premium. Given that the R&D intensity averaged across all the home countries of foreign firms is 1.1 percentage points higher than China's R&D intensity, the average R&D intensity differential translates into an export price differential of 10.09 log points (approximately 11%) between foreign and domestic firms, implying that a big share of the multinational price premium is associated with home countries' innovation capability.

Second, the multinational price premium is higher for foreign invested firms with technicians and managers sent from the headquarters. These foreign employees likely embody the “tacit knowledge” which cannot be reduced to a statement in a manual, but is a key component in the transfer of intangible assets from parent companies. Our results complement the finding in Markusen and Trofimenko (2009) that foreign experts, as a channel of knowledge transfer, have substantial and persistent positive effects on wages and firm productivity.

Third, the multinational price premium is even higher for majority- or wholly owned affiliates than for minority-owned affiliates. The result is consistent with the fact that a higher level of foreign ownership is preferred if there is more risk of dissipation of firm-specific intangible assets (Desai et al., 2004; Gatignon and Anderson, 1988; Ramachandran, 1993).

Fourth, in the case of vertical specialization, the export price is significantly higher by foreign firms than by domestic suppliers, indicating that foreign multinationals tend to keep production of higher quality

goods within firm boundaries while outsourcing production of lower-quality goods to Chinese suppliers.<sup>2</sup> Since production of high-quality components requires more strict quality control and verification, our result accords well with Atalay et al. (2014) who find that vertical ownership allows more efficient transfers of intangible inputs (e.g., managerial oversight) within the firm rather than moderating goods transfers down production chains.

Therefore, our results suggest that in addition to productivity gains, the transfer of intangible assets within multinationals plays an important role in affecting export prices by enhancing the ability of foreign affiliates to produce higher quality.<sup>3</sup> We also show that the multinational price premium cannot be explained by alternative hypotheses. (1) The multinational price premium is not a result of transfer pricing by multinationals. We find that multinationals from high-tax countries charge slightly lower export prices. Thus, there is no evidence that foreign parent companies shift profits to China in order to reduce tax payments. (2) The multinational price premium does not stem from the higher tendency to use imported inputs by foreign invested firms. Although the export price is positively related to the use of imported inputs, the estimated price differential between foreign and domestic firms reduces only slightly after including the use of imported inputs. (3) The multinational price premium is not attributable to local R&D activities. The price premium remains little changed after controlling for local firms' R&D intensity. (4) The multinational price premium does not arise from the market power of multinational firms. Although we find that bigger exporters charge higher prices in more concentrated markets, the magnitude of the estimate is too small to explain the large multinational price premium. (5) The multinational price premium does not reflect consumer bias toward home brands. We separate exports by foreign firms into those sent back to home countries and those to third markets, but find no significant difference in the multinational price premium between home countries and third markets.

To summarize, the estimated multinational price premium reflects not only differences between foreign and domestic firms in productivity, but more importantly, the differences in firm-specific intangible assets such as R&D capability. Our results further imply that technological catch-up by domestic firms requires investment not only in physical capital, but also in intangible assets.

Our study contributes to the literature on multinational firms and international technology transfer. It has been well recognized that foreign ownership leads to significant productivity gains (e.g., see Brown et al., 2006; Arnold and Javorcik, 2009; Bloom et al., 2012) and improvement in financial performance and firm value (e.g., Chari et al., 2010; Fraser and Zhang, 2009). Our study suggests another source of gains from foreign direct investment, i.e., the transfer of intangible assets within multinationals enhances the capability of foreign subsidiaries to produce high quality.

Our study also makes several contributions to the trade-and-quality literature. The recent studies by Baldwin and Harrigan (2011), Verhoogen (2008), and Kugler and Verhoogen (2012) have emphasized the role of productivity in determining output quality and export prices. They argue that productive firms use more expensive inputs in order to produce goods of higher quality and higher prices. Our study confirms these existing results. However, we also find that in addition to productivity, higher ability to produce quality (as a result of transfer of intangible

<sup>2</sup> The China Customs data classify each export transaction into processing export or non-processing export (“ordinary export”). Processing trade is a form of vertical specialization, involving imported inputs being further processed in China and finished goods being exported to other countries. Export processing by foreign firms represents a form of vertical integration, while export processing by domestic firms represents a form of “contractual outsourcing” in which local suppliers serve a particular foreign buyer with specialized contracts. See Section 5.2.4 for more detail.

<sup>3</sup> Given that firm productivity is controlled for, if technology transfer improves production efficiency without upgrading quality, we would not observe any significantly positive relationship between export prices and proxies for the transfer of intangible assets within multinationals.

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