



# Benefit or damage? The productivity effects of FDI in the Chinese food industry



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## ABSTRACT

We investigate the impact of foreign direct investment (FDI) on the total factor productivity of Chinese food firms using firm-level census data between 1998 and 2007 (174,940 sample food firms). We test for within-firm, within-industry, and vertical effects. We find that the effect of FDI on the productivity of Chinese food firms depends significantly on the type of FDI and its countries of origin. FDI from non-HMT (Hong Kong, Macaw and Taiwan) regions can improve the productivity of the invested firm, and also increases the productivity of domestic food firms through vertical industry linkages. However, domestic food firms may be crowded out by non-HMT investment in the same industry. HMT investment can generate positive within-industry productivity spillovers, but negative vertical spillovers. Our findings have immediate implications for policymakers in China, as well as for governments of less developed countries that are formulating foreign investment policies.

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## 1. Introduction

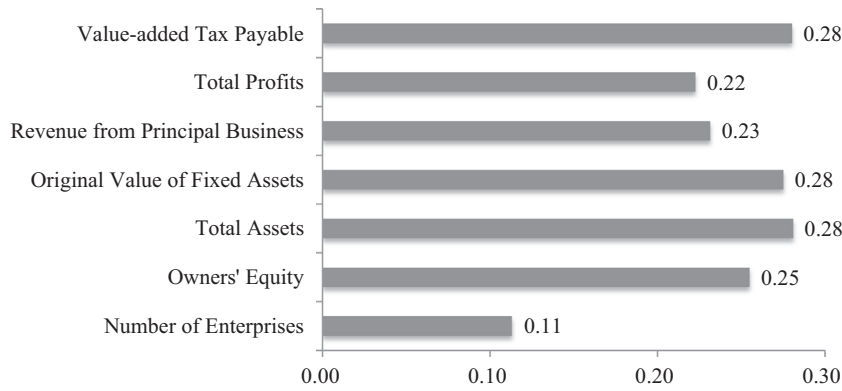
Developing countries continue to be an attractive destination for international investors. According to the United Nations Conference on Trade and Development (UNCTAD), foreign direct investment (FDI) flows to developing economies reached US\$ 681 billion (or 55 percent of global flows) in 2014, maintaining overwhelming superiority over FDI flows to developed economies (41 percent of global flows). China, the leading recipient of FDI, absorbed 10 percent of total world FDI flows, or 19 percent of FDI flows to developing countries (UNCTAD, 2015). Consistent with these patterns in global investment, agriculture-related multinational enterprises are also expanding their scale around the world (Hossain et al., 2005; Mao et al., 2015; Marchant et al., 1999; Muehlfeld et al., 2011). In 2007, world FDI flows into food, beverages, and tobacco industries reached US\$ 450 billion, more than five times the 1990 level (US\$ 80 billion) (UNCTAD, 2009).

It is widely believed that FDI from developed countries contributes to the development and structural improvement of the food industry in less developed countries (Cheng, 2012; Mhlanga et al., 2010; Yin, 2010). First, FDI provides a source of funds that are critical to the development of the food industry (Ni, 2011;

Yin, 2010). Second, FDI can improve the productivity of the food industry in the host country via advanced production and management technologies brought into the foreign invested firms (FIEs) (Cheng, 2012; Jin and Tokunaga, 2007; Ni, 2011; Yin, 2010). Third, domestic food firms may benefit from technology spillovers and global market information, and become more competitive in the international market (Lv and Huang, 2006b).

Despite these potential benefits, there are concerns that FDI may also lead to negative spillovers on domestic firms in developing countries (Aitken and Harrison, 1999; Djankov and Hoekman, 2000; Görg and Greenaway, 2004; Konings, 2001). Other studies have shown that FDI may lead to a crowding out of domestic firms (De Backer and Sleuwaegen, 2003; Kosová, 2010), leading some to conclude that the negative impact of FDI on the domestic food industry is substantial (Ni, 2011; Yin, 2010). In the Chinese food sector, foreign equity occupied about a quarter of total owners' equity in 2012, and foreign invested food firms possessed 28 percent of sectoral assets and generated almost a quarter of sectoral profits and revenue, despite accounting for only 11 percent of total firm numbers (see Fig. 1). In recent years, foreign capital has dominated or occupied an influential position in the Chinese food industry. For instance, in the edible oil processing industry, foreign equity constitutes 66 percent of the entire industry equity, and foreign firms occupy as high as 85 percent of the edible oil market share in China (Lv, 2009; Ni, 2011). With respect to the dairy

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**Fig. 1.** The proportion of foreign invested firms to all firms in the Chinese food industry in 2012 for several indices. *Notes:* The observations are all industrial enterprises with annual sales over 20 million Chinese Yuan. *Source:* China Statistical Yearbook, 2013.

industry, FIEs have more than 33 percent of the domestic market share (Lv, 2009). Compared to domestic middle and small-sized food firms, FIEs have a competitive advantage that might lead to a crowding out of domestic firms (Ding and Kong, 2014).

Despite the large volume of FDI inflows into China and the potentially conflicting effects of FDI, little empirical research has been conducted to ascertain the impact of FDI on the productivity of the Chinese food industry. Research has investigated the impact of FDI on the productivity of the Chinese manufacturing industry; e.g. Abraham et al. (2010), Du et al. (2012), Hu and Jefferson (2002) and Lin et al. (2009). Yet, the food industry is an industry with a generally lower technological level relative to other industries, which increases the likelihood that FDI leads to adverse intra-industry productivity spillovers (Bwalya, 2006). Hence, the food industry is relatively more vulnerable to competition from foreign firms with more advanced technology (Jeon et al., 2013), which suggests that the influence of FDI in the food sector may be different from those in the manufacturing sector.

We use firm-level census data spanning the years 1998–2007 to systematically investigate the productivity impacts of FDI on the Chinese food industry. Specifically, we assess the productivity impacts of FDI at three levels: the share of foreign equity within a firm (firm level productivity effects); the effects of foreign investment within the same industry (intra-industry spillover effects); and the effects of foreign investment in upstream and downstream sectors (vertical spillover effects). Moreover, we investigate whether FDI of different origins result in different productivity effects. For China there are two primary sources of FDI: FDI from Hong Kong, Macao and Taiwan (HMT) where investors are typically overseas Chinese, and FDI from other countries, mainly OECD countries. These two kinds of FDI differ in several aspects. First, FIEs with non-HMT origins are more likely to be equipped with advanced technology and managerial skills with the intention of accessing the domestic market, whereas FDI from HMT mainly flows into labor-intensive industries and are more export-oriented (Abraham et al., 2010; Girma et al., 2009). Second, a significant portion of HMT investment is actually domestic investment that is routed through HMT to take advantage of a preferential tax policy to joint ventures (Broadman and Sun, 1997; Du et al., 2012). Third, HMT foreign equity constitutes a large part of total foreign equity in Chinese enterprises (Xu and Sheng, 2012); in our sample, the ratio was about 33 percent in the food sector during 1998–2007. To allow us to understand whether these differences lead to significant differences in the impact of FDI on domestic firm productivity, we analyze the impact of FDI from different origins separately.

## 2. The impact of FDI on productivity

Many studies attempt to explain the productivity effects of FDI, such as Aitken and Harrison (1999), Borensztein (1998), Findlay (1978), Javorcik (2004) and Markusen and Venables (1999). According to the literature, FDI may affect productivity in the following ways.

First, FDI plays an important role in improving the productivity of the invested firm. Foreign investment brings advanced manufacturing techniques and qualified human resources (Borensztein, 1998; Hallam, 2009). In addition, with a comprehensive international production network, foreign firms enjoy cheap and/or high-quality intermediate goods imported from overseas (Borensztein, 1998), and compared with domestic firms, more firm-specific staff training in FIEs (Görg and Strobl, 2005) upgrades firms' general level of technique.

Besides the firm level productivity effects, intra-industry effects or “spillover effects” may occur with foreign investment inflows. FDI can influence firm productivity in the entire industry in three ways: domestic food firms can improve their level of technology by imitating and learning from FIEs, and thus enhance productivity (Blomström and Persson, 1983; Findlay, 1978; Koizumi and Kopecky, 1977); domestic companies may benefit from the technological and managerial knowledge brought by skilled employees who once worked in foreign affiliates (Fosfuri et al., 2001; Görg and Strobl, 2005); and the entry of foreign firms intensifies the competition in the host country market, forcing domestic firms to improve productivity (Teecce, 1977).

However, a prerequisite for positive intra-industry effects is a domestic sector with absorptive capacity (Hallam, 2009; Kokko, 1994). If the technological gap between domestic firms and foreign investors in the same industry is large, then a negative intra-industry effect is more likely to take place (Jeon et al., 2013). FIEs may use their technological advantage to crowd out the domestic firms (Zhang, 2001), one consequence of which might be a higher average cost stemming from the decline in sales volume (Aitken and Harrison, 1999). As a result, FDI might decrease a domestic firm's productivity, which is known as the “market-stealing” effect.

Finally, from the perspective of inter-industry linkages, the FDI may generate vertical spillovers, which includes backward and forward spillovers. Backward spillovers occur when foreign participation in the downstream sectors enhances the productivity of upstream food firms. According to Javorcik (2004), backward spillovers may take place mainly through three channels. First, foreign companies provide direct technological support to local suppliers. Second, local suppliers have to upgrade their technology and management to meet higher requirements for product quality of

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