Foreign Ownership and Firm Productivity: Causality and Channels*

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Abstract

Using data from a survey conducted by the World Bank in China, this paper shows that foreign ownership enhances firm productivity. We also find that only equity ownership from foreign firms can have such a positive impact, but not ownership from foreign institutional investors, banks, or individuals. Among the many possible channels, we find that the increased likelihood of trading with the rest of the world, transfer of technology, managerial skills and products are the potential channels through which foreign ownership exerts a positive impact on firm productivity.

Keywords: Foreign ownership, labor productivity, total factor productivity, trade

JEL classification: D21, D23, F14, F19, G32, L23.

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1 Introduction

This paper addresses three questions: (1) whether foreign ownership helps boost a firm's productivity; (2) if so, which types of foreign ownership matter; and (3) how foreign ownership enhances the firm's productivity.

Dunning (1977, 1980, 1988) proposes an eclectic framework for understanding the activities of multinational enterprises (MNEs). The framework argues that MNEs tend to be relatively more competitive than the more-informed domestic firms because MNEs own more advanced non-tangible productive assets, such as technological know-how, management and marketing skills, overseas contacts, coordinated relationships with suppliers and customers, and branded products. The need to protect these proprietary assets and various other transaction cost concerns lead MNEs to transfer these assets to their own foreign subsidiaries rather than to license them to unrelated local firms. Hence, it is expected that foreign ownership leads to the improvement of firm productivity.

However, international evidence on this argument has been inconclusive. Aitken and Harrison (1999) find in a panel of Venezuelan plants that increases in foreign equity participation are correlated with increases in productivity for recipient plants with less than 50 employees, but there is no such impact on bigger plants. Djankov and Hoekman (2000) find that foreign investments have a positive impact on the productivity growth of recipient firms in the Czech Republic. Using a difference-in-differences approach combined with propensity score matching, Arnold and Javorcik (2009) find a causal positive impact of foreign ownership on firm productivity in Indonesia.

In contrast, examining the data of manufacturing firms in the United Kingdom, Harris and Robinson (2002) find that the superior productivity of foreign-owned plants is due to self-selection (i.e., foreign firms selectively pick the better firms to acquire), and firms in general experience productivity decline after the acquisitions. Javorcik (2004) does not find that foreign share of a firm increases its productivity growth in Lithuania. Barbosa and Louri (2005) show that in Portugal and Greece, foreign firms do not differ much from their

domestic counterparts in terms of their return on assets except for those firms at the upper quantiles of gross profit. Benfratello and Sembenelli (2006) find that foreign ownership has no impact on firm productivity in Italy.[1]

In this paper, we re-examine the relations between foreign ownership and firm productivity using a survey of firms in China conducted by the World Bank in early 2003. China provides an ideal setting to study the impact of foreign ownership on firm productivity. Since adopting the open-door policy in 1978, China has attracted a huge amount of foreign direct investment (FDI). The amount of FDI increased from a total of US$4.1 billion for the period of 1979-1984 to US$69.5 billion in 2006, making China the largest recipient of FDI in the world (China Statistical Yearbook, 2007). More importantly, FDI is believed to be one of the driving forces behind China's spetacular economic growth in the past three decades. The Chinese government at all levels places attracting FDI high on their agenda, with an expectation that FDI would bring capital, advanced technological know-how, and marketing and management skills, among others.

The ordinary-least-squares (OLS) regression results show that a higher share of foreign ownership is associated with a higher firm productivity. In terms of economic magnitude, a 10% increase in foreign share is associated with an 11.86% increase in the value-added per worker. To conclude that this relation is indeed due to a causal impact, i.e., foreign ownership indeed enhances firm productivity, we rule out a number of alternative explanations and conduct various robustness checks.

First, we check that our finding is not driven by some omitted variables. We introduce a host of covariates related to firm characteristics (including capital stock, firm size, firm age,

[1]There are some studies on the relations between foreign ownership and firm performance in the context of China, for example, Zhang, Zhang, and Zhao (2001, 2002), Du and Girma (2009), and Girma, Gong, and Görg (2009). Our study differs from these papers in several aspects. First, our analysis covers firms from 18 cities in 16 provinces, instead of focusing on a specific region (Shanghai) as in Zhang, Zhang, and Zhao (2001, 2002). Next, we focus on firm productivity (measured either by value-added per worker or total factor productivity) as the indictor for firm performance rather than sales to the domestic and foreign market used by Du and Girma (2009) and innovation used by Girma, Gong, and Görg (2009). Moreover, we further investigate which type of foreign ownership has an impact on firm productivity and the channels through which foreign ownership boosts firm productivity, which are absent in all these studies.

state ownership, property rights protection, and contract enforcement) and CEO characteristics (including his/her human capital and political capital) used in the previous studies, as well as industry and city dummies. Our result is robust to the inclusion of these controls.

Second, we are still concerned about potential biases due to some unobserved characteristics and the reverse causality issue (i.e., more productive domestic firms attract more foreign investments). To address these potential endogeneity issues, we use the two-step Generalized Method of Moments (GMM) estimation with two instruments for foreign ownership, namely, the average share of foreign ownership in firms belonging to other industries but located in the same city, and the average share of foreign ownership in firms belonging to the same industry but located in other cities (Section 3.1 discusses the identification strategy of using these instruments). The two-step GMM estimation reinforces our findings that foreign ownership has a positive and significant causal impact on firm productivity.

Third, we explore alternative measures of firm productivity (i.e., total factor producitivity estimated using either panel fixed-effect or Levinsohn and Petrin's (2003) methodology) and an alternative measure of foreign ownership (registered legal status), use quantile regression and a sub-sample excluding the top and bottom 1% to deal with possible impact of outlying observations, and investigate whether the results are biased due to some sample selection issues such as coastal-city firms, service firms, and rapidly-growing firms.

The dataset contains information about the types of foreign investors, which allows us to investigate the differential impacts of different types of foreign ownership. We find that only the shares owned by foreign firms have a positive impact on firm productivity, while those owned by foreign institutional investors, banks, and individuals do not have such an impact.

Finally, we explore some possible channels through which foreign ownership may affect firm productivity. We find that the productivity improvement from foreign ownership may come from the transfer of technology, managerial skills and products, and the bridging with overseas markets, but not from the increase of investments and the better-coordinated relations with suppliers and customers.

The remainder of the paper is structured as follows. Section 2 introduces the data and variables for the empirical study, while Section 3 presents the estimation strategy and the empirical results. Section 4 concludes.

2 Data and Variables

Our empirical analysis uses the data from the *Survey of Chinese Enterprises* (SCE) conducted by the World Bank in cooperation with the Enterprise Survey Organization of China in early 2003.[2] For a balanced representation, the SCE selects 18 cities from 16 provinces located in five areas in China: Northeast area – Benxi, Changchun, Dalian, and Harbin; Coastal area – Hangzhou, Jiangmen, Shenzhen, and Wenzhou; Central area – Changsha, Nanchang, Wuhan, and Zhengzhou; Southwest area – Chongqing, Guiyang, Kunming, and Nanning; and Northwest area – Lanzhou and Xi'an.

In each city, the SCE randomly samples 100 or 150 firms from 14 industries, including nine manufacturing (garment and leather products, electronic equipment, electronic parts making, household electronics, automobile and automobile parts, food processing, chemical products and medicine, biotech products and Chinese medicine, and metallurgical products) and five service industries (information technology, accounting and non-banking financial services, advertisement and marketing, business services, and transportation equipment including telecommunication and ship-building). The total number of firms surveyed is 2,400.

The SCE is composed of two parts. One is a general questionnaire directed at the senior management seeking information about the firm, innovation, product certification, marketing, relation with suppliers and customers, access to markets and technology, relation with the government, labor, infrastructure, international trade, finance, taxation, and the CEO and board of directors. The other questionnaire is directed at the accountant and personnel manager covering ownership, various financial measures, and labor and training.

[2]The data set has been used by Cull and Xu (2005), and Dong and Xu (2009), among others. Meanwhile, there is a new survey of Chinese enterprise recently conducted by the World Bank covering firms in 100+ cities in China (the third wave in 2005). However, that dataset is not yet publicly available.

Most of the information from the first part of the SCE pertains to the survey year of 2002, while the second part pertains to the period of 2000-2002.

We are interested in the impacts of foreign ownership on firm productivity, which is the dimension of firm performance most studied in the literature (e.g., Atiken and Harrison, 1999; Barbosa and Louri, 2005; Javorcik, 2005; Benfratello and Sembenelli, 2006; Arnold and Javorcik, forthcoming). One measure of firm productivity is labor productivity, which is calculated as the logarithm of the value-added divided by the total employment (denoted as *Labor productivity*).[3] An alternative measure is total factor productivity (TFP), which is estimated using either the panel fixed-effect method (denoted as *TFP FE*) or the Levinsohn and Petrin's (2003) methodology (denoted as *TFP LP*).[4]

Table 1 reports the summary statistics of the data, while Table 2 reports bivariate correlations among the key variables. Referring to Table 1, the mean (standard deviation) of *Labor productivity* is 3.550 ($\pm$1.505), that of *TFP FE* is 4.154 ($\pm$1.074), and that of *TFP LP* is 3.493 ($\pm$0.992). Referring to Table 2, these three measures of firm productivity are highly correlated, with correlation ranging from 0.8524 (between *Labor productivity* and *TFP FE*) to 0.9876 (between *TFP FE* and *TFP LP*).

The key explanatory variable of our study is the degree of the firm's foreign ownership. The SCE has detailed information about the firm's ownership structure in 1999 and 2002 (the survey year), i.e., the percentage of shares owned by the private sector (including domestic top manager or family, other domestic individuals, domestic institutional investors, domestic firms, domstic banks, foreign individuals, foreign institutional investors, foreign firms, and foreign banks) and the goverenment (including national government, state/provincial

[3]The value-added is equal to the total output minus the total materials.

[4]Note that the TFP is a revenue-based measure rather than a quantity-based one. To recover the quantity-based measure of TFP, we need the firm-level price to deflate the revenue-based output. As firm-level prices are rarely available, a commonly used method in the literature is to deflate the revenue-based output by the industry average price index. This procedure, however, introduces the omitted price bias (Klette and Griliches, 1996). One way to address this problem is to assume a constant elasticity of substitution demand function and to include industry total revenue-based output as an additional control (Klette and Griliches, 1996; De Loecker, 2009). Accordingly, in most of our regressions, we include industry dummies, which, in a cross-section analysis, is essentially the same as the method above for recovering the quantity-based TFP.

government, local/municipal government, and other government including cooperative and collective enterprises). To partially alleviate the reverse causality concern, we construct the explanatory variable, *Foreign share*, as the logarithm of (one plus the percentage of shares owned by foreign individuals, foreign institutional investors, foreign firms, and foreign banks in 1999). As a robustness check, we also use the registered legal status by the firm to define the foreign ownership. Accordingly, the variable, *Foreign status*, takes the value of one if the firm registers itself as a subsidiary/division or a joint venture of a multinational firm, and the value of zero otherwise. Referring to Table 1, on average, 5.9% of the shares are owned by the foreign investors and 6% of the firms are registered either as the subsidiaries/divisions or joint ventures of multinational firms.

To investigate which types of foreign ownership has impact on firm productivity, we separate foreign ownership into three different types based on the types of foreign investors: foreign firms, foreign individuals, and foreign institutions (including foreign institutional investors and foreign banks). Similar to the measurement of *Foreign share*, we use the logarithm of (one plus the percentage of shares owned by these three different types of foreign investors in 1999) and construct three variables, *Foreign firms*, *Foreign individuals*, and *Foreign institutions*, respectively.

We also control for other variables that may possibly affect both firm productivity and foreign ownership as a way to address the omitted variables bias. These include firm and CEO characteristics, as well as industry and city. The variables related to firm characteristics are *Capital stock* (measured by the logarithm of total fixed assets in book value), *Firm size* (measured by the logarithm of total employment), *Firm age* (measured by the logarithm of years of establishment up to the end of 2002), *State ownership* (measured by the percentage of shares owned by the government), *Property rights protection* (the percentage of government officials oriented towards helping rather than hindering firm operations), and *Contract enforcement* (the percentage that the legal system will uphold the firm's contract

and property rights in business disputes).[5] The CEO characteristics include measures of his/her human capital – *CEO Education* (years of schooling), *CEO Tenure* (years as being CEO), and *Deputy CEO previously* (a dummy variable indicating whether the CEO was the deputy CEO before becoming the CEO);[6] and his/her political capital – *Government cadre previously* (a dummy variable indicating whether the CEO was the government official before becoming the CEO) and *Party member* (a dummy variable indicating whether the CEO was a member of the Chinese Communist Party).[7] To capture industry and city characteristics, we include industry and city dummies.

To further address the endogeneity issues (i.e., the omitted variable bias and the reverse causality), we use the two-step GMM estimation using two instruments for the firm-level measure of foreign ownership. The first instrument is the average degree of foreign ownership among firms belonging to the same industry but located in other cities, and the second instrument is the average degree of foreign ownership among firms belonging to other industries but located in the same city. Section 3.1 discusses the identification strategy using these two instruments.

To understand how foreign ownership may affect firm productivity, we construct seven channel variables. We use *Education level* (measured by the average years of schooling of the total employment) to proxy for the acquirement of advanced technological know-how, *Training* (measured by the percentage of employees receiving formal training) to proxy for the transfer of management and marketing skills, *Certificate* (a dummy variable indicating whether the firm has certificates from ISO or other international organizations on quality assurance) to proxy for the quality of the final goods, *Export* (measured by the percentage of overseas customers) and *Import* (measured by the percentage of overseas suppliers) to proxy

[5]Johnson, McMillan, and Woodruff (2002) and Cull and Xu (2005) use these measures to investigate the importance of property rights protection and finance on the reinvestment rate. Meanwhile, Cull and Xu (2005) compare the measures of property rights protection and contract enforcement used here to those used in the literature.

[6]Cull and Xu (2005) use these variables to investigate the impacts of property rights protection and finance on reinvestment rate.

[7]Li, Meng, Wang, and Zhou (2008) use these variables to examine the impact of political connections on business performance.

for the overseas contacts, *Dispute* (measured by the percentage of disputes with suppliers and customers) to proxy for the degree of coordination with suppliers and customers, and *Reinvestment* (measured by the percentage of profit reinvested) to proxy for the investment incentive.

3 Empirical Analysis

3.1 Empirical Strategy

To evaluate the impact of foreign ownership on firm productivity, we estimate the following equation:

$$y_{fic} = \alpha + \beta \cdot s^F_{fic} + X'_{fic}\Gamma + \varepsilon_{fic}, \tag{1}$$

where f, i, and c index firm, industry, and city, respectively; y_{fic} is the measure of firm productivity (i.e., *Labor productivity*, *TFP FE*, and *TFP LP*); s^F_{fic} is the measure of foreign ownership (i.e., *Foreign share* and *Foreign status*); X_{fic} is a set of control variables (i.e., firm and CEO characteristics, and industry and city dummies); and ε_{fic} is the error term. To deal with the possible heteroskadasticity problem, the standard errors are White-corrected and are clustered at the industry-city level.

Estimating equation (1) involves three concerns. First, even with a list of control variables (X_{fic}), it could still be possible that the residual error, ε_{fic}, conditional on the controls X_{fic}, might be correlated with the measure of foreign ownership, s^F_{fic}, so that $E(s^F_{fic}, \varepsilon_{fic}) \neq 0$, in which case the estimates would be biased. Second, it could be possible that foreign investors only select the more productive firms to invest, causing a reverse causality. Even though we mainly use the measure of foreign ownership in 1999 (three years before the survey), the reverse causality may still exist if foreign investors are forward-looking or if firm productivity persists over time. Third, the degree of foreign ownership (s^F_{fic}) could be measured with (possibly considerable) the measurement error (M_{fic}), resulting in an attenuation bias.

To deal with these concerns, we use the instrumental variable approach. A valid instrumental variable estimation not only enables us to address the possible endogeneity issue (i.e., the omitted variables bias and the reverse causality), but it also corrects for the measurement error if the measurement error has the classical orthogonal properties, that is, being uncorrelated with the measure of foreign ownership (i.e., $E(s^F_{fic}, M_{fic}) = 0$).

Motivated by the recent literature on empirical industrial organization (e.g., Berry, Levinsohn, and Pakes, 1995; Nevo, 2000, 2001), we use the average degree of foreign ownership among firms belonging to the same industry but located in other cities, and the average degree of foreign ownership among firms belonging to other industries but located in the same city as the two instruments for the degree of foreign ownership in the concerned firm.[8] The intuition of using these two instruments is as follows.

Note that with the inclusion of industry and city dummies, the only possible remaining omitted variables are at the industry-city level or individual firm-level. Thus, the two instruments, representing the average degree of foreign ownership among firms belonging to either the same industry but located in other cities or other industries but located in the same city, should not be correlated with the industry-city level or individual firm-level characteristics, implying that the instrumental variable estimation satisfies the exclusion restriction condition. In the empirical anlaysis, we further report the Hansen J statistic or the over-identification test after all the instrumental variable estimations to confirm the exclusion restriction condition.

Meanwhile, the two instruments should be negatively correlated with the endogeneous variable (i.e., the degree of foreign ownership in the concerned firm). Take the instrument, the average degree of foreign ownership among firms belonging to the same industry but located in other cities, as an illustration. With industry dummies controlling for the absolute

[8]For example, in estimating the price elasticity for a brand, Nevo (2000, 2001) uses the average price in other cities as the instrument for the price in the concerned city. The proposed rationale is that with the inclusion of city dummies, the only possible omitted variables are at the within-city level. Thus, the average price in other cities is not expected to be correlated with those within-city characteristics. Moreover, the average price in other cities reflects the same underlying features of firms, for example, their production technologies and costs, and thus is expected to be positively correlated with the price in the concerned city.

degree of foreign ownership across different industries, the instrumental variable and the endogenous variable are deviations from the industry averages; thus they should move in the opposite direction. Intuitively, as the industry dummies control for the total amount of foreign capital inflow across different industries, the inter-city difference within the industry reflects the allocation of foreign capital across different cities. Thus, given the total amount of foreign capital inflow, it is reasonable that the more foreign capital goes to other cities, the less is left for the concerned city. In other words, the instrumental variable is expected to be negatively correlated with the endogenous explanatory variable, implying that the instrumental variable estimation satisfies the relevance condition.

Accordingly, the first stage of our instrumental variable estimation is as follows:

$$s^F_{fic} = \delta + \eta \cdot s^F_{i,-c} + \theta \cdot s^F_{-i,c} + X'_{fic}\Psi + \mu_{fic}, \tag{2}$$

where $s^F_{i,-c}$ is the average degree of foreign ownership among firms belonging to the same industry (i) but located in other cities ($-c$); and $s^F_{-i,c}$ is the average degree of foreign ownership among firms belonging to other industries ($-i$) but located in the same city (c). In addition to reporting the estimated coefficients of the two instrumental variables, we further report the Anderson canonical correlations LR statistic for the relevance condition and the Cragg-Donald F-statistic for checking weak instruments.

3.2 Does Foreign Ownership Boost Firm Productivity?

Table 3 reports the OLS estimation results of equation (1). As shown in Column 1, *Foreign share* has a positive and statistically significant estimated coefficient, implying that labor productivity is higher for firms with a larger degree of foreign ownership. In terms of the economic significance, a firm with an additional 10% foreign share on average outperforms an otherwise equivalent firm by 11.86% in terms of value-added per worker.[9]

[9]If foreign share is zero, then $\ln(0\% + 1) = 0$. If $\ln(x\% + 1) = 1$,then $x\% = 1.718$. The estimated coefficient, $\beta = \frac{\partial y}{\partial x} = \frac{\partial \log(\text{value-added per worker})}{\partial \ln(s\%+1)} = \frac{\%\text{ change in labor productivity}}{\partial \ln(s\%+1)}$ Accordingly, we interpret that if

To alleviate the concern of the omitted variables bias, we include controls related to city dummy, industry dummy, firm characteristics, and CEO characteristics in Columns 2-5 in a stepwise fashion. Clearly, the positive impact of foreign ownership on firm productivity remains robust to these additional controls. With the inclusion of city dummies, the estimated coefficient of *Foreign share* drops about 25% from 2.037 to 1.544, suggesting that the degree of foreign ownership differs systematically across China's cities. This is consistent with the literature on FDI in China that coastal regions absorb a disproportionally larger share of total FDI in China compared with the inland regions (Amiti and Javorcik, 2008; Du, Lu, and Tao, 2008). Moreover, with the inclusion of firm characteristics, there is another significant drop of 40% in the estimated coefficient of *Foreign share* from 1.558 to 0.619. This suggests that even within a finely-defined city and industry, firms differ substantially in their capability to attract foreign capital. With the full set of control variables, the results imply that a 10% increase in foreign share is on average associated with a 3.85% increase in value-added per worker.

The control variables also make economic sense. Firms that are more capital-intensive are relatively more productive, as reflected by the positive and significant coefficient of *Capital stock*. More labor-intensive firms, on the other hand, are relatively less productive, as reflected by the negative and significant coefficient of *Firm size*. Older firms exhibit relatively lower labor productivity. This is consistent with the experience of economic transition that new firms drive economic development by creating jobs, supplying consumer goods, mobilizing savings, and ending the monopoly of state enterprises (McMillan and Woodruff, 2002). Firms with a higher degree of state control are less productive. This is consistent with the findings in the literature that state-owned firms in China are less-efficient due to their multi-tasks responsibilities: beyond profit-maximization, they are also concerned about social stability (e.g., Bai, Li, Tao, and Wang, 2000). Among the CEO characteristics,

foreign share increases from 0% to 171.8%, then there will be $\widehat{\beta} = 203.7\%$ change in value-added per worker. Or in other words, on average, if foreign share increases by 10%, the % change in value-added per worker is roughly $\frac{203.7\%}{17.18} = 11.86\%$.

a more-educated CEO boosts the firm's productivity, which is consistent with the previous research on education and growth (e.g., Barro, 2001).

To ensure that our findings in Table 3 are not biased due to the endogeneity issue and the measurement error problem, we re-estimate equation (1) using the two-step GMM with two instruments as discussed in Section 3.1. Table 4 reports the estimation results. Panel B in the bottom-half of the table shows the first stage results of the two-step GMM estimation. Consistent with the intuition given in Section 3.1, both instrumental variables are negative and statistically significantly correlated with the endogenous variable. Meanwhile, the Anderson canonical correlations LR statistic confirms that our instrument variables are relevant, and the Cragg-Donald F-test rules out the concern of weak instruments.[10] Moreover, the Hansen J statistic is statistically insignificant, implying that out instruments satisfy the exclusion restriction condition.

Panel A in the top-half of Table 4 reports the second stage results of the two-step GMM estimation. In Column 1, we include firm characteristics along with a full set of industry and city dummies, while in Column 2, we further include CEO characteristics. We find that *Foreign share*, after being instrumented, continues to exert a positive and statistically significant impact on firm productivity. The estimated coefficients range from 1.731 ($\pm$0.826) to 1.858 ($\pm$0..894), which are about two times larger than the corresponding OLS estimates. In terms of economic significance, an additional 10% of foreign share is on average associated with a 10.08-10.81% increase in value-added per worker. This is consistent with the argument that measurement errors may drive the OLS estimates downward to zero and that the endogeneity issues serve to bias the coefficient of foreign ownership downward rather than upward.

We conduct three additional sets of robustness checks on the impact of foreign ownership on firm productivity. First, we use two alternative measures of firm productivity, namely, TFP calculated using either the panel fixed-effects method and the methodology of Levinsohn

[10]The F-statistic is significantly above the critical value (10) of the "safe zone" for strong instrument (Staiger and Stock, 1997).

and Petrin (2003), and an alternative measure of foreign ownership. Table 5 shows the estimation results, with the odd columns showing the OLS estimates and the even columns showing the two-step GMM estimates.[11] Clearly, our earlier finding on the impact of foreign ownership on firm productivity is robust to these alternative measures of firm productivity and foreign ownership.

Second, one possible concern is that our results may be driven by some particular outliers. To address this issue, we use two estimation specifications: the quantile regression to estimate specification (1), and the OLS and the two-step GMM estimations using a sub-sample excluding the top and bottom 1%. The estimation results are reported in Table 6. Clearly, foreign ownership still casts a positive and statistically significant impact on firm productivity, ruling out the concern of the outliers.

Finally, we investigate whether our results are biased due to some sample selection issues. **(1) Coastal areas**. According to Amiti and Javorcik (2008), most FDI in China goes to the coastal areas. If firms in the coastal areas are generally more productive, our results would reflect the differences across coastal and non-coastal regions rather than the impact of foreign ownership. To tackle this concern, we exclude firms from the four coastal cities and re-do the same estimation. Columns 1-2 of Table 7 report the OLS and the two-step GMM estimates, respectively. The estimated coefficients of the foreign ownership continue to be positive and statistically significant, suggesting that our main results does not simply pick up the systematic regional differences. **(2) Service firms**. Compared with manufacturing industries, service industries do not usually have straightforward supply chains. Indeed, there are many missing information about total materials in the service industries (more than 70% of the sample). To rule out the concern that our results are biased due to the imprecise measures of firm productivity and foreign ownership from service firms, we focus on a sub-sample of manufacturing firms. Columns 3-4 of Table 7 report the OLS and the

[11] In the two-step GMM estimation with *Foreign status* as the measure of foreign ownership, the two instruments are the percentage of firms registered as subsidiaries/divisions or joint ventures of multinational firms in the same industry but different cities, and the percentage of firms registered as subsidiaries/divisions or joint ventures of multinational firms in the same city but different industries.

two-step GMM estimates, respectively. It is clear that qualitatively, our early findings on the positive and statistically significant impact of foreign ownership on firm productivity remain robust to this sub-sample, despite the fact that the magnitude drops by about 10%.

(3) Rapidly-growing firms. McMillan and Woodruff (2002) argue that in the emerging economies, expanding and growing a business involves considerably different requirements from the external environments than does the business entry. The intuition is that the protection of private properties significantly affects the willingness of the entrepreneurs to enter the market, while the expansion and the growth of businesses require the sophistication of market-supporting institutions, such as financial institutions. Thus, it could be possible that our results are driven by those rapidly-growing firms who often are associated with high productivity and are eager for the external capital. To rule out this concern, we focus on a sub-sample excluding those rapidly-growing firms. A firm is defined as "rapidly-growing" if its employment growth rate in the past three years exceeds the industry average; otherwise, it is defined as "slowly-growing". Columns 5-6 of Table 7 report the OLS and the two-step GMM estimates, respectively. Clearly, our earlier finding on the impact of foreign ownership on firm productivity is robust to this sub-sample.

In summary, the results reported in Tables 3-7 show that firms with more foreign ownership are more productive than those otherwise-equivalent firms. These results are consistent with Dunning's (1977, 1980, 1988) framework and some of the studies in the literature from other countries, as well as the conventional wisdom held by the politicians and the public.

3.3 Which Types of Foreign Ownership Matter?

There are different types of foreign investors, such as multinational firms, foreign banks, foreign institutional investors, and foreign individuals. These foreign investors not only possess different endowments but also different motives for investing. For example, multinational firms often have superior technology, experienced managerial skills, and branded products, and they want to extend the profitability of these proprietary assets to other markets. Insti-

tutional investors and individuals, acting more like venture capitalists, do not have specific expertise in any particular technology and managerial skill, and they focus more on investing in the company and taking it to IPO. Due to these different endowments and motives, foreign ownership from different sources should have different impacts on firm productivity. However, to the best of our knowledge, no previous study in the literature has looked at these impact differentials, presumably due to the limitation of the data. Fortunately, the SCE contains detailed information on the types of foreign investors, allowing us to investigate which type of foreign ownership has an impact on firm productivity.

We divide foreign investors into three types: foreign firms, foreign individuals, and foreign institutions (including foreign institutional investors and foreign banks), and construct three different variables accordingly (i.e., *Foreign firms*, *Foreign individuals*, and *Foreign institutions*). Table 1 presents the detailed definitions of these variables. The estimation results are reported in Table 8. We use both the OLS regression (Column 1) and the two-step GMM regression (Column 2). In the two-step GMM regression, we treat all these three variables (i.e., *Foreign firms*, *Foreign individuals*, and *Foreign institutions*) as endogenous, and thus there are three first stages. To save space and to focus on the central issue, we do not report the estimated coefficients of these three first stages (available upon request) and only present various econometric tests for the three first stages.

We find that *Foreign firms* has positive and statistically significant estimated coefficients, whereas *Foreign individuals* and *Foreign institutions* not only have statistically insignificant coefficients, their estimated coefficients also change signs across the OLS estimation and the GMM estimation. These results imply that only the increase in shares owned by foreign firms leads to an improvement in firm productivity, and the capital from either foreign individuals or foreign institutional investors and foreign banks has no effect on firm productivity. This provides further empirical clarification of Dunning' (1977, 1980, 1988) framework that not all foreign capital could increase firm's productivity. Only foreign capital that comes from firms that requires the internalization of their proprietary assets from within a firm would

boost productivity.

3.4 How Does Foreign Ownership Affect Firm Productivity?

Having established the causal impacts of foreign ownership on firm productivity, we investigate in this section the channels through which foreign ownership may affect firm productivity.

As argued by Dunning (1977, 1980, 1988), MNEs own more advanced non-tangible productive assets, such as superior technology, experienced managerial skills, and branded products, which enable them to be more competitive than the more-informed local domestic firms. To proxy for the endowment and possible transfer of these proprietary assets, we use *Education level* (measured by the average years of schooling of the total employment), *Training* (measured by the percentage of employees receiving formal training), and *Certificate* (a dummy variable indicating whether the firm has certificates from the ISO or other international organizations on quality assurance). On the other hand, foreign capital may bring more overseas contacts; studies have shown that firms increase their productivity through learning by exporting (e.g., Blalock and Gertler, 2004; Van Biesebroeck, 2005; De Loecker, 2007) and from new-imported inputs (Goldberg, Khandelwal, Pavcnik, and Topalova, 2009). To measure the extent of export and import, we use *Export* (measured by the percentage of overseas customers) and *Import* (measured by the percentage of overseas suppliers). Moreover, we use *Dispute* (measured by the percentage of disputes with suppliers and customers) to proxy the degree of coordination with suppliers and customers, and *Reinvestment* (measured by the percentage of profit reinvested) to proxy for the investment incentive.

Following Mckenzie and Sakho (2009), we explore the channel by regressing various channel variables, and we include the full set of control variables as used in the previous tables, such as firm and CEO characteristics, and industry and city dummies. The regression results are reported in Table 9. We focus on the two-step GMM estimates to save space; the OLS estimates are qualitatively the same (available upon request). The first stages of these

two-step GMM estimations are not reported to save space (available upon request). We find that *Foreign share* has positive and statistically significant impact in five out of the total seven channels, namely, *Education Level*, *Training*, *Certificate*, *Export*, and *Import*. These results suggest that the productivity improvement from foreign ownership may come from the transfer of technology, managerial skills, and products, and from bridging with overseas markets, the latter of which is consistent with the findings by Arnold and Javorcik (forthcoming) in Indonesia. There is no supportive evidence indicating that foreign ownership brings more reinvestment incentives and more-coordinated relations with the suppliers and the customers.

4 Conclusion

Using the data from the World Bank in China, we confirm the prediction of Dunning's framework that foreign firms are more productive than domestic firms. The positive and casual impact of foreign ownership on firm productivity is robust to the instrumental variable estimation approach, to alternative measures of productivity and foreign ownership, to the outliers, and to different subsamples. In particular, we find in our two-step GMM estimation that a 10% increase in the foreign share leads around a 10% increase in labor productivity. The impact is both statistically and economically significant.

We have also documented that only foreign ownership from foreign firms has a positive impact on productivity but not ownership from foreign banks, institutional investors, and individuals. This is consistent with the Dunning's framework that MNEs own intangible assets that differentiate them from their local counterparts.

We provide evidence indicating that foreign ownership enhances firm productivity most likely through the transfer of technology, managerial skills and products, and by bridging firms with overseas markets.

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Table 1. Summary statistics and variable description

Variable	Obs	Mean	S.D.	Min	Max	Description
Firm productivity						
Labor productivity	1597	3.550	1.505	-2.996	11.892	log((total sales-total materials)/ total employment)
TFP FE	1599	4.154	1.074	-1.023	11.040	TFP (panel fixed-effect method)
TFP LP	1599	3.493	0.992	-1.815	10.487	TFP (Levinsohn and Petrin (2003)'s methodology)
Foreign ownership						
Foreign share	2399	0.059	0.168	0.000	0.693	log(1+ % of shares owned by foreign individuals, foreign institutional investors, foreign firms, and foreign banks in 1999)
Foreign status	2400	0.060	0.238	0.000	1.000	=1 if the firm registers it either as a subsidiary/division or a joint venture of a multinational firm
Foreign firms	2399	0.035	0.129	0.000	0.693	log(1+ % of shares owned by foreign firms in 1999)
Foreign individuals	2399	0.012	0.080	0.000	0.693	log(1+ % of shares owned by foreign individuals in 1999)
Foreign institutions	2399	0.012	0.084	0.000	0.693	log(1+ % of shares owned by foreign institutional investors and foreign banks in 1999)
Firm characteristics						
Capital stock	2339	8.752	2.455	0.000	17.526	log(total fixed assets in book value)
Firm size	2396	4.850	1.491	0.000	11.159	log(total employment)
Firm age	2400	2.430	0.799	1.099	3.970	log(years of establishment up to the end of 2002)
State ownership	2399	0.241	0.417	0.000	1.000	% of shares owned by the government
Property right protection	2225	0.343	0.314	0.000	1.000	% of government officials that is oriented toward helping rather than hindering firm operations
Contract enforcement	2068	0.640	0.389	0.000	1.000	% that the legal system will uphold the firm's contractual and property rights in business disputes
CEO characteristics						
CEO Education	2382	15.643	2.394	0.000	19.000	years of schooling
CEO Tenure	2371	5.771	4.255	1.000	33.000	years of being CEO
Deputy CEO previously	2378	0.274	0.446	0.000	1.000	=1 if the CEO was the deputy CEO before becoming the CEO
Government cadre previously	2378	0.060	0.237	0.000	1.000	=1 if the CEO was the government cadre before becoming the CEO
Party member	2351	0.668	0.471	0.000	1.000	=1 if the CEO was the member of the Chinese Communist Party
Instrumental variable						
Average degree of foreign ownership among firms belonging to the same industry but located in other cities	2400	0.058	0.037	0.000	0.140	the average of *Foreign share* of firms of other industries in the same city
Average degree of foreign ownership among firms belonging to other industries but located in the same city	2400	0.057	0.047	0.008	0.212	the average of *Foreign share* of firms of other cities in the same industry
Channels						
Education level	1170	2.703	0.671	1.000	7.000	average years of schooling of the total employment
Training	1989	0.335	0.353	0.000	1.000	% of employees receiving formal training
Certificate	2400	0.361	0.480	0.000	1.000	=1 if the firm has certificates from ISO or other international organizations on quality assurance
Export	2326	0.091	0.260	0.000	1.000	% of oversea customers (measured by sales)
Import	2212	0.053	0.177	0.000	1.000	% of oversea suppliers (measured by expenditures)
Dispute	1618	0.039	0.097	0.000	1.000	% of disputes with suppliers and customers
Reinvestment	2115	0.176	0.323	0.000	1.000	% of profit reinvested

Table 2. Correlations among key variables

	Labor productivity	TFP FE	TFP LP	Foreign share	Average degree of foreign ownership among firms belonging to the same industry but located in other cities	Average degree of foreign ownership among firms belonging to other industries but located in the same city
Labor productivity	1.0000					
TFP FE	0.8524	1.0000				
TFP LP	0.8720	0.9876	1.0000			
Foreign share	0.2452	0.2322	0.2217	1.0000		
Average degree of foreign ownership among firms belonging to the same industry but located in other cities	0.0439	0.0013	0.0046	0.1066	1.0000	
Average degree of foreign ownership among firms belonging to other industries but located in the same city	0.1848	0.2145	0.1982	0.2432	0.0281	1.0000

Table 3. OLS estimates

	1	2	3	4	5
Dependent variable	Labor productivity				
Foreign share	2.037***	1.544***	1.558***	0.619***	0.624***
	[0.274]	[0.276]	[0.263]	[0.197]	[0.206]
Controls					
Firm characteristics					
Capital stock				0.351***	0.336***
				[0.031]	[0.030]
Firm size				-0.229***	-0.240***
				[0.051]	[0.052]
Firm age				-0.404***	-0.400***
				[0.054]	[0.052]
State ownership				-0.290***	-0.308***
				[0.107]	[0.113]
Property right protection				0.118	0.137
				[0.105]	[0.112]
Contract enforcement				-0.024	0.008
				[0.099]	[0.101]
CEO characteristics					
CEO Education					0.033**
					[0.016]
CEO Tenure					-0.004
					[0.008]
Deputy CEO previously					0.004
					[0.068]
Government cadre previously					0.033
					[0.156]
Party member					0.055
					[0.066]
City dummies	No	yes	yes	yes	yes
Industry dummies	No	no	yes	yes	yes
Observations	1597	1597	1597	1358	1312
R-squared	0.0604	0.1742	0.2444	0.3722	0.3727
F-test	55.26	12.04	55.73	42.63	43.25

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the constant term, but its coefficient is not reported to save space (available upon request).

Table 4. GMM estimates

	1	2
Panel A, second stage: Dependent variable is labor productivity		
Foreign share	1.731**	1.858**
	[0.826]	[0.894]
Controls		
Firm characteristics		
Capital stock	0.329***	0.314***
	[0.035]	[0.033]
Firm size	-0.229***	-0.242***
	[0.052]	[0.052]
Firm age	-0.369***	-0.380***
	[0.058]	[0.053]
State ownership	-0.194*	-0.228**
	[0.108]	[0.111]
Property right protection	0.102	0.121
	[0.101]	[0.108]
Contract enforcement	0.008	0.051
	[0.095]	[0.097]
CEO characteristics		
CEO Education		0.021
		[0.017]
CEO Tenure		-0.004
		[0.007]
Deputy CEO previously		0.041
		[0.063]
Government cadre previously		0.039
		[0.146]
Party member		0.163*
		[0.099]
City dummies	yes	yes
Industry dummies	yes	yes
Panel B, first stage: Dependent variable is foreign share		
Average degree of foreign ownership among firms belonging to the same industry but located in other cities	-4.066***	-3.778***
	[0.740]	[0.846]
Average degree of foreign ownership among firms belonging to other industries but located in the same city	-1.614***	-1.328**
	[0.611]	[0.607]
Anderson canonical correlations LR statistic	[81.15]***	[67.12]***
Cragg-Donald F-statistic	40.61	33.28
Hansen J statistic	1.801	1.976
p-value for Hansen J statistic	0.180	0.160
Observations	1358	1312

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the constant term, but their coefficients are not reported to save space (available upon request). The first stages of the two-step GMM estimations include the same set of control variables as in the corresponding second stage, but the estimated coefficients of these control variables are not reported to save space (available upon request).

Table 5. Robustness checks I: Alternative measures of firm productivity and foreign ownership

	1	2	3	4	5	6
Dependent variable	TFP FE		TFP LP		Labor productivity	
Estimation specification	OLS	GMM	OLS	GMM	OLS	GMM
Foreign share	0.375***	1.292***	0.376***	1.317***		
	[0.114]	[0.497]	[0.116]	[0.505]		
Foreign status					0.500***	1.178**
					[0.125]	[0.509]
Controls						
Firm characteristics						
Capital stock	0.096***	0.081***	0.029	0.014	0.338***	0.325***
	[0.020]	[0.021]	[0.020]	[0.022]	[0.030]	[0.033]
Firm size	0.285***	0.281***	0.267***	0.263***	-0.237***	-0.236***
	[0.033]	[0.034]	[0.034]	[0.034]	[0.052]	[0.055]
Firm age	-0.239***	-0.225***	-0.246***	-0.231***	-0.398***	-0.389***
	[0.035]	[0.035]	[0.035]	[0.036]	[0.052]	[0.053]
State ownership	-0.207***	-0.136*	-0.211***	-0.139*	-0.301***	-0.236**
	[0.079]	[0.073]	[0.080]	[0.074]	[0.112]	[0.111]
Property right protection	0.06	0.045	0.062	0.048	0.137	0.106
	[0.079]	[0.076]	[0.079]	[0.077]	[0.112]	[0.107]
Contract enforcement	0.009	0.046	0.013	0.05	0.014	0.049
	[0.072]	[0.067]	[0.072]	[0.067]	[0.101]	[0.099]
CEO characteristics						
CEO Education	0.015	0.006	0.015	0.006	0.033**	0.027*
	[0.010]	[0.011]	[0.010]	[0.011]	[0.016]	[0.016]
CEO Tenure	-0.003	-0.001	-0.003	-0.001	-0.004	-0.004
	[0.005]	[0.005]	[0.005]	[0.005]	[0.008]	[0.008]
Deputy CEO previously	0.028	0.052	0.026	0.051	0.007	0.034
	[0.048]	[0.045]	[0.048]	[0.045]	[0.067]	[0.064]
Government cadre previously	0.037	0.042	0.040	0.044	0.025	0.020
	[0.093]	[0.088]	[0.094]	[0.089]	[0.155]	[0.150]

Party member	0.040	0.127**	0.037	0.125**	0.019	0.047
	[0.041]	[0.062]	[0.042]	[0.063]	[0.067]	[0.070]
City dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Summary of the first stage of the two-step GMM estimation						
Average degree of foreign ownership among firms belonging to the same industry but located in other cities		-3.805***		-3.805***		
		[0.863]		[0.863]		
Average degree of foreign ownership among firms belonging to other industries but located in the same city		-1.385**		-1.385**		
		[0.605]		[0.605]		
Percentage of firms registered as subsidiaries/divisions or joint ventures of multinational firms in the same industry but different cities						-2.243***
						[0.663]
Percentage of firms registered as subsidiaries/divisions or joint ventures of multinational firms in the same city but different industries						-3.152***
						[0.403]
Anderson canonical correlations LR statistic		[69.85]***		[69.85]***		[73.23]***
Cragg-Donald F-statistic		34.67		34.67		36.39
Hansen J statistic		1.725		1.786		1.738
p-value for Hansen J statistic		0.189		0.181		0.187
Observations	1328	1328	1328	1328	1312	1312

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the constant term, but their coefficients are not reported to save space (available upon request). The first stages of the two-step GMM estimations include the same set of control variables as in the corresponding second stage, but the estimated coefficients of these control variables are not reported to save space (available upon request).

Table 6. Robustness checks II: Outliers

	1	2	3
Dependent variable	Labor productivity		
Estimation specification	Quantile	OLS	GMM
Sample	Whole	Without top and bottom 1%	
Foreign firms	0.694***	0.614***	1.508*
	[0.194]	[0.182]	[0.881]
Controls			
Firm characteristics			
Capital stock	0.342***	0.292***	0.271***
	[0.024]	[0.027]	[0.030]
Firm size	-0.250***	-0.184***	-0.179***
	[0.037]	[0.044]	[0.044]
Firm age	-0.350***	-0.347***	-0.330***
	[0.047]	[0.044]	[0.044]
State ownership	-0.204**	-0.336***	-0.288***
	[0.091]	[0.105]	[0.107]
Property right protection	0.117	0.113	0.100
	[0.102]	[0.109]	[0.105]
Contract enforcement	0.051	0.088	0.137*
	[0.085]	[0.088]	[0.083]
CEO characteristics			
CEO Education	0.045***	0.023	0.014
	[0.015]	[0.014]	[0.016]
CEO Tenure	0.000	0.003	0.003
	[0.007]	[0.007]	[0.007]
Deputy CEO previously	0.040	0.067	0.098*
	[0.071]	[0.062]	[0.059]
Government cadre previously	-0.089	0.074	0.088
	[0.153]	[0.154]	[0.145]
Party member	0.100	0.068	0.149
	[0.073]	[0.065]	[0.095]
City dummies	yes	yes	yes
Industry dummies	yes	yes	yes
Summary of the first stage of the two-step GMM estimation			
Average degree of foreign ownership among firms belonging to the same industry but located in other cities			-3.740***
			[0.828]
Average degree of foreign ownership among firms belonging to other industries but located in the same city			-1.274**
			[0.587]
Anderson canonical correlations LR statistic			[66.05]***
Cragg-Donald F-statistic			32.73
Hansen J statistic			2.293
p-value for Hansen J statistic			0.130
Observations	1312	1312	1290

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the constant term, but their coefficients are not reported to save space (available upon request). The first stages of the two-step GMM estimations include the same set of control variables as in the corresponding second stage, but the estimated coefficients of these control variables are not reported to save space (available upon request).

Table 7. Robustness checks III: Subsamples

	1	2	3	4	5	6
Dependent variable	Labor productivity					
Excluded type of firms	Coastal cities		Service industries		Rapidly-growing firms	
Estimation specification	OLS	GMM	OLS	GMM	OLS	GMM
Foreign share	0.940***	3.732***	0.564***	1.619**	1.053***	2.858**
	[0.262]	[1.093]	[0.213]	[0.812]	[0.254]	[1.243]
Controls						
Firm characteristics						
Capital stock	0.317***	0.267***	0.352***	0.330***	0.307***	0.279***
	[0.034]	[0.039]	[0.031]	[0.033]	[0.041]	[0.043]
Firm size	-0.206***	-0.188***	-0.249***	-0.253***	-0.217***	-0.217***
	[0.059]	[0.065]	[0.054]	[0.054]	[0.067]	[0.066]
Firm age	-0.403***	-0.350***	-0.408***	-0.387***	-0.438***	-0.407***
	[0.055]	[0.058]	[0.060]	[0.059]	[0.061]	[0.062]
State ownership	-0.341***	-0.222*	-0.311**	-0.238*	-0.259**	-0.181
	[0.121]	[0.117]	[0.124]	[0.125]	[0.129]	[0.125]
Property right protection	0.119	0.113	0.2	0.187	0.22	0.185
	[0.126]	[0.119]	[0.123]	[0.118]	[0.144]	[0.139]
Contract enforcement	0.055	0.077	0.018	0.07	-0.026	0.007
	[0.114]	[0.115]	[0.111]	[0.105]	[0.115]	[0.117]
CEO characteristics						
CEO Education	0.022	0.006	0.035**	0.026	0.025	0.009
	[0.019]	[0.020]	[0.017]	[0.018]	[0.024]	[0.026]
CEO Tenure	0.003	0.005	-0.002	-0.002	-0.009	-0.011
	[0.009]	[0.009]	[0.008]	[0.008]	[0.010]	[0.010]
Deputy CEO previously	0.016	0.078	-0.034	-0.006	0.05	0.09
	[0.078]	[0.068]	[0.073]	[0.069]	[0.091]	[0.086]
Government cadre previously	0.011	0.02	-0.083	-0.087	0.097	0.104
	[0.163]	[0.147]	[0.186]	[0.175]	[0.194]	[0.179]
Party member	0.086	0.273***	0.023	0.127	0.127	0.258**

	[0.073]	[0.102]	[0.069]	[0.102]	[0.084]	[0.129]
City dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
Summary of the first stage of the two-step GMM estimation						
Average degree of foreign ownership among firms belonging to the same industry but located in other cities		-5.241***		-3.274***		-3.654***
		[1.209]		[0.781]		[1.017]
Average degree of foreign ownership among firms belonging to other industries but located in the same city		-1.158*		-1.739***		-1.040*
		[0.592]		[0.538]		[0.605]
Anderson canonical correlations LR statistic		[51.77]***		[57.23]***		[39.73]***
Cragg-Donald F-statistic		25.54		28.33		19.28
Hansen J statistic		0.279		1.825		1.688
p-value for Hansen J statistic		0.597		0.177		0.194
Observations	1096	1096	1108	1108	836	836

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the constant term, but their coefficients are not reported to save space (available upon request). The first stages of the two-step GMM estimations include the same set of control variables as in the corresponding second stage, but the estimated coefficients of these control variables are not reported to save space (available upon request).

Table 8. Different types of foreign ownership

	1	2
Dependent variable	Labor productivity	
Estimation specification	OLS	GMM
Foreign firms	1.150***	3.207***
	[0.278]	[1.086]
Foreign institutions	-0.095	0.520
	[0.309]	[2.112]
Foreign individuals	0.012	-1.077
	[0.454]	[1.032]
Controls		
Firm characteristics		
Capital stock	0.334***	0.301***
	[0.031]	[0.035]
Firm size	-0.241***	-0.244***
	[0.053]	[0.055]
Firm age	-0.403***	-0.383***
	[0.052]	[0.051]
State ownership	-0.298***	-0.223**
	[0.112]	[0.107]
Property right protection	0.147	0.151
	[0.112]	[0.110]
Contract enforcement	0.010	0.019
	[0.101]	[0.104]
CEO characteristics		
CEO Education	0.033**	0.033*
	[0.016]	[0.017]
CEO Tenure	-0.003	0.001
	[0.008]	[0.008]
Deputy CEO previously	0.002	0.003
	[0.066]	[0.064]
Government cadre previously	0.023	0.033
	[0.154]	[0.146]
Party member	0.053	0.139
	[0.067]	[0.097]
City dummies	yes	yes
Industry dummies	yes	yes
Summary of the first stage of the two-step GMM estimation		
Anderson canonical correlations LR statistic		[34.90]***
Cragg-Donald F-statistic		5.68
Hansen J statistic		7.374
p-value for Hansen J statistic		0.061
Observations	1293	1293

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include the constant term, but their coefficients are not reported to save space (available upon request). The three first stages of the two-step GMM estimations include the same set of control variables as in the corresponding second stage, but the estimated coefficients of these control variables as well as those of the instrumental variables are not reported to save space (available upon request).

Table 9. Channels

	1	2	3	4	5	6	7
Dependent variable	Education level	Training	Export	Import	Dispute	Certificate	Reinvestment
Estimation specification				GMM			
Foreign share	0.756*	0.483*	0.417***	0.505***	-0.003	0.410*	-0.165
	[0.418]	[0.247]	[0.160]	[0.115]	[0.044]	[0.228]	[0.169]
Observations	982	1573	1862	1779	1367	1898	1701

Note: Robust standard errors, clustered at the industry-city level, are reported in the brackets. *, **, *** represent the statistical significance at the 1%, 5%, and 10% level, respectively. All regressions include a set of controls as used in the previous tables and the constant term, but the estimated coefficients of these controls are not reported to save space (available upon request). The three first stages of the two-step GMM estimations include the same set of control variables as in the corresponding second stage, but the estimated coefficients of these control variables as well as those of the instrumental variables are not reported to save space (available upon request).