

The Implications of Foreign Buyouts for Firm Profitability

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Abstract

Venturing with a local partner was the predominant strategy for Multinational Enterprises (MNEs) entering the Chinese market in the 1980s and 1990s. However, rapid economic development and gradual legislation relaxation yielded a continuous decline of joint ventures (JVs) and a rising position for foreign wholly owned subsidiaries (WOSs). We investigate the factors affecting foreign buyout decisions and their performance implications. Exploiting a unique longitudinal dataset of Chinese enterprises, our study reports that the foreign equity percentage, the number of foreign partners in the JV interacted with enterprise age, and relative labor intensity are important determinants of foreign buyouts. Although simple difference-in-differences estimates show that foreign buyouts yield an immediate negative impact on firm profitability rates and a sustained positive impact on firm profits relative to the industry mean, alternative propensity score matching methodology demonstrates that these results are biased and misleading. Using a difference-in-differences matching estimator and three alternative measures of profitability, firm performance is found to neither improve nor deteriorate after foreign buyouts.

1 Introduction

Venturing with a local partner was the predominant strategy for Multinational Enterprises (MNEs) entering the Chinese market in the 1980s and early 1990s. However, rapid economic development and gradual relaxation of the foreign direct investment regime have yielded a continuous decline of joint ventures (JVs) and a rising position of foreign wholly owned subsidiaries (WOSs). One of the driving forces behind the increasing dominance of foreign WOSs is that many MNEs decide to internalize their joint owned operations by buying out their Chinese partners. For example, China-FedEx Corporation, which set up a JV with Tianjin Datian W. Group Co., Ltd. (DTW Group) in 1999, bought out its JV partner in 2006 to take control of the venture's facilities in 89 locations throughout China. Procter & Gamble purchased the 20% stake held by its partner - Hutschison Whampoa China Ltd in 2004 in order to assume full ownership, although it claimed that it had 7 years of successful cooperation with its valuable local partner. These media-highlighted buyouts demonstrate the important trend of strategic revisions of foreign firms in China, but they only represent a fraction of the phenomena: a vast majority of such buyouts involve micro- and middle-market companies, which do not attract significant media attention, but are crucial to a systematic analysis.

This study examines the effect of changes in firm structure on firm profitability by exploiting a unique longitudinal dataset. We start by exploring the factors that determine the transformation of JVs into foreign WOSs. Our research question is not only relevant to China, but also to a wide range of transition economies where MNEs are restructuring earlier investments to reflect their growing strategic importance (Luo, 2007; Steensma et al., 2008). The observed pattern of firm restructuring is consistent with the hypothesis that

international JVs are merely a temporary organizational form (Porter, 1990; Williamson, 1991) and inherently unstable (Kogut, 1989). More importantly, we explore the causal relationship between foreign buyouts and firm performance. If firm characteristics remain largely unchanged upon a foreign buyout, then changes in performance could be attributed to the change in ownership structure. As such, we are able to examine the performance implications of full foreign ownership relative to partial foreign ownership arrangements.

There is a body of literature investigating whether foreign ownership, compared with domestic ownership, improves firm productivity and wages (Girma and Gorg, 2007; Lipsey and Sjöholm, 2002; Griffith and Simpson, 2003; Girma and Wakelin, 2001). Our research question is related to these earlier studies, but with an important distinction. Rather than comparing foreign owned firms with domestically owned firms, we examine differences in the performance of Sino-foreign JVs which have undergone a foreign buyout and firms that remain Sino-foreign JVs. In other words, we examine the performance implications of different organizational structures. This exercise is particularly meaningful in the Chinese context because until recently China's foreign direct investment (FDI) regulations only allowed foreign firms to operate in a restrictive environment. The government-sanctioned mode of entry for foreign firms came in the form of Sino-foreign JVs. Due to the particularities of the regulatory regime, all FDI into China is greenfield FDI rather than brownfield FDI, which is counter to the pattern observed in the rest of the developed and developing world. China's rapid economic development and gradual legislation relaxation has altered the landscape for MNEs. The emergence of foreign buyouts is an important phenomenon reflecting the strategic revisions of MNEs in China.

In contrast to earlier studies which merely investigate the one-off ownership choice

of MNEs upon their entry to a foreign market (Ellis, 2008; Fisch, 2008; Chen, 2008), we focus on the ex-post strategic revision of MNEs. Improving upon previous research on the dynamic process of foreign operation (Xia et al., 2008; Steensma et al., 2008), we use longitudinal ownership data to examine not only the factors affecting JV buyouts, but also the performance implications of foreign buyout activity. To address the selection bias issue inherent in the restructuring decision, we use propensity score matching methodology that enables us to establish comparability between JVs which undergo a foreign buyout and JVs that do not experience such transformation.

Foreign buyouts could lead to better firm performance if foreign owners are able to improve the efficiency of their WOSs. Buyouts could also lead to no change in performance if the foreign partner has transferred know-how in the course of the Sino-foreign partnership and no additional efficiency gains are possible after the buyout. Under this scenario foreign buyouts are motivated by a desire by the foreign partner to be entitled to the entire stream of profits rather than a part. It is also possible that foreign buyouts lead to a decline in profitability due to assimilation problems and the loss of a valuable local partner.

We consider three alternative measures of profitability as outcome variables - profits scaled by average industry profits, return on assets, and profits to sales ratio. We find on the one hand, a high percentage of foreign ownership improves the odds of a buyout possibly because of the smaller additional investment required to achieve full ownership. On the other hand, the number of foreign partners in a JV has a marginally negative impact on the likelihood of a foreign buyout suggesting that it is potentially challenging to transform a JV with a large number of foreign partners into a WOS. However, the older the JV and the higher the number of foreign partners, the more likely the JV is to be transformed into a

WOS implying that the advantages of partner collaboration decline with time. Firms which use a more labor-intensive production process relative to the industry mean are more likely to be taken over, signaling potential for cost cutting from shedding excess labor. After carefully matching JVs that receive wholly owned subsidiary treatment with firms that remain Sino-foreign JVs, we find that there are no statistically significant differences in performance across all three measures of profitability. This is in sharp contrast to results from naive difference-in-differences estimates. In the absence of matching, foreign buyouts have a pronounced positive effect on firm profits relative to the industry mean, but appear to generate an immediate negative impact on the ratio of total profits to total sales. The difference in results underlines the importance of carefully selecting an appropriate control group. After carefully matching JVs that receive wholly owned subsidiary treatment with firms that remain Sino-foreign JVs, we find that there are no statistically significant differences in performance across all three measures of profitability.

The rest of the chapter is organized as follows. Section 2 reviews alternative theories of firm organization and generates hypotheses. Section 3 offers a brief overview of FDI history and regulations in China. Section 4 introduces the dataset. The difference-in-differences matching econometric approach and construction of variables are discussed in Sections 5 and 6 respectively. Section 7 presents the results of balancing tests and discusses the matching estimation results. Section 8 concludes.

2 Related Literature

This study is related to two interwoven branches of literature examining the formation and dissolution of JVs, and the performance differences between foreign and domestic firms. We review them in order to situate our study in their relative context.

Sinha (2001) uses a two-firm two-period model to theorize the formation and dissolution of JVs. In the first period, due to an ownership restriction in the host economy, the foreign MNE chooses between licensing and JV. In the second period it chooses between takeover and set-up of a new fully owned subsidiary. If the MNE develops a new technology after the JV formation and has information advantage over its local partner about the true value of the new technology, it tends to offer a buyout to reap the full benefit when the host ownership restriction relaxes. This is more likely to occur when setting up a new subsidiary involves substantial start-up cost and hence becomes a less favorable choice relative to transforming the JV to WOS.

Using an organizational learning approach, Chowdhury and Chowdhury (2001) suggest that JV formation involves synergies between the two parent firms. However, with time there is organizational learning as the firms learn about each other's strengths. Thus, over time the value of the synergistic effect declines, leading to JV breakdown. Similarly, Habib and Mella-Barral (2006) theorize that the acquisition of knowhow makes every JV temporary. The more knowhow is acquired, the fewer the benefits of joint operations relative to separate operations. But JV dissolution is not necessarily an indicator of failure. The partner who is bought out at dissolution need not be viewed as the losing party since it shares in the ensuing increase in value through the buyout price it receives for its stake in the venture. Steensma et al. (2008) study JV buyouts and also consider which partner is

likely to be the buyer. They find that learning alone does not determine the decision of the transformation of a JV to a full ownership arrangement in the context of Hungary. Conflict between two parent firms dictates the decision. When there are low levels of conflict, learning from the foreign parent increases the likelihood that the local parent internalizes the JV. When there are high levels of conflict, learning from the foreign parent increases the likelihood that the foreign parent will internalize the JV.

Marjit and Chowdhury (2004) focus on market demand as a determinant of subsequent takeovers. They demonstrate that when a JV is already in place, and there is an increase in demand, the MNE re-evaluates its options regarding subsidiary formation and buyout. If the increase in demand is large enough, opening a subsidiary becomes more profitable compared with remaining with the JV. If the MNE has superior access to capital compared with its local counterparts, then the threat of subsidiary formation is credible, and the MNE can drive down the payoff of its local partner in case of a buyout to its reservation level. Thus a buyout is profitable provided the aggregate payoff from a buyout exceeds that from subsidiary formation.

Shleifer and Vishny (1986) discuss the potential for growth in value resulting from a takeover by a large stakeholder, where the rest of the shares are 'diffusedly' held. They demonstrate the role of a large stakeholder in bringing up the value of the firm in the context of free-rider problem. As the initial shareholding of the large shareholder increases, the possibility of takeover increases. However, Svejnar and Smith (1984) suggest that MNE control over its host country operation could be lower under a full ownership arrangement compared with a JV in the presence of powerful local stakeholders (such as the State). First, if the foreign company collaborates with a number of widely diffused local shareholders,

even minority shareholding could enable it with high control. Second, local partners do make useful contributions. For example, in the Chinese context, Chinese partners provide a form of informal regulatory insurance, acting as government liaisons for their foreign partners. A stand-alone foreign operation might become subject to cumbersome bureaucratic processes and even political intervention. As a result, if the value provided by the local partners, such as political connections and institutional knowledge, cannot be bought in the market, foreign MNEs may prefer to remain in a JV arrangement in order to utilize the intangible assets held by their local partners.

Our study also relates to a body of literature that documents the performance advantage of foreign firms relative to domestic firms. There is evidence that foreign MNEs perform better than domestic firms based on a number of indicators. Girma and Gorg (2007) study wages in the aftermath of foreign acquisitions in the UK. They find sizable post-acquisition wage effects on skilled and unskilled workers following an acquisition by a US firm. But such effects are absent for acquisitions by EU multinationals. Lipsey and Sjöholm (2002) find that foreign firms in Indonesia pay 50% higher wages than domestic firms. This perceived advantage is partially eroded once worker education levels, industry and location of plants are taken into account. After controlling for firm characteristics, foreign ownership is associated with a 25% wage premium for blue-collar workers and a 50% wage premium for white-collar workers. Griffith and Simpson (2003) report that foreign firms in the UK pay higher wages than domestic firms for both administrative and technical employees based on 1980 and 1995 data. Girma and Wakelin (2001) find a 14% overall wage differential in favor of workers in foreign firms using 1991 to 1996 UK data. The foreign wage premium declines to 10% higher when industry and scale of operations are taken into account. In

addition, the annual wage growth is 0.4 percent higher in foreign firms.

Focusing on output per employee or value added per employee, the following studies assemble evidence that foreign MNEs outperform local firms. Blomstrom and Wolff (1994) find that both value added and gross output per employee are more than twice as high in MNEs for 20 individual manufacturing industries in Mexico. Haddad and Harrison (1993) using 1985-89 data from Morocco, find that output per worker is higher in foreign firms than in domestic firms in 12 out of 18 industries. Ramstetter (1999) reports that value added per employee is higher in foreign firms than domestic firms in five East Asian countries over a 15-20 year period. Girma and Wakelin (2001) find that foreign firms in the UK in 1991-1996 have 10% higher labor productivity than domestic firms. Using predominantly cross-sectional analysis techniques, studies have achieved close to unanimity on the higher productivity of foreign firms in both developed and developing countries. None of these studies comment directly on the performance differences arising from partial versus full foreign ownership.

Our study aims to address the performance implications for firms transitioning from JVs to WOSs. Our work is distinct from previous research in a number of respects. First, we use a detailed longitudinal dataset of Chinese firms with foreign participation and focus on events where firms change their ownership structure. This allows us to examine the dynamic performance trajectory of firms rather than basing conclusions on average differences between WOSs and JVs. Second, since organizational changes do not occur at random, we control for potential selection bias issues by comparing the performance of firms that receive foreign WOS treatment with a carefully constructed control group of firms that remain Sino-foreign JVs. Finally, we study a variety of profitability variables

giving us a detailed view into the performance of restructured firms.

3 FDI in China: Institutions and Regulations

China has been highly successful in attracting and absorbing large quantities of FDI as a result of policies developed over the past quarter of a century. The gradual relaxation of foreign ownership holding regulations has shaped the ownership choices of MNEs in China. At the beginning of reforms in the 1980s, over 70% of FDI was in the form of equity or cooperative JV. This percentage descended to 50% in 1992. 1997 marks the turning point where the number of foreign WOSs exceeded that of JVs for the first time. China's accession to WTO deepened the trend and by 2001 equity and cooperative JVs only accounted for 30% of total FDI, which is almost a complete reversal of the 1980s. Chinese media has labeled this phenomenon "the dearth of Sino-foreign JVs".

According to Chinese JV regulations, the parties to the JV share the profits, risks and losses in proportion to their respective contribution to the registered capital. Most JVs have a built-in mechanism for potential buyouts. Under this mechanism the equity interest to be transferred is first offered to the other equity holders at the proposed sale price to the third party, before any transfer to a third party can be made (Zimmerman, 2004). Two trends have contributed to the increasing dominant role of fully foreign owned enterprises. One is that many foreign firms choose to enter or re-enter the market by setting up full ownership projects upfront. Second, foreign firms either increase their shareholding in existing JVs or simply buyout their Chinese partners to assume full ownership. Sino-foreign JVs are taken over by their foreign parties not necessarily because the JVs failed, but possibly because

they have achieved their purpose. Although buyouts by Chinese parties do occur, we only focus on the former type of takeover.

4 Data

This study uses a panel dataset of all enterprises with foreign participation located in Wuxi, China. The dataset is part of a larger nation-wide Foreign Direct Investment Survey launched by the Chinese government in 2001 to closely monitor foreign business activities. The dataset provided to us by the Wuxi Municipal Government includes seven years of foreign shareholding information between 2001 and 2007. The ownership information pinpoints the year of ownership change from partial foreign ownership to full foreign ownership, and offers a unique opportunity to study the causal relationship between foreign takeovers and firm performance. While our sample does not represent the universe of all foreign-invested firms in China, it captures an important and representative portion of foreign-invested firms in east-coast China.

Wuxi is located in Jiangsu province, an east-coast Province of China. Although Guangdong Province (south-coast) was the first region to receive substantial FDI in earlier decades, Jiangsu topped the league in 2006 with a total 17.34 USD billions of FDI inflow.¹ Along with Shanghai and Zhejiang Province, Jiangsu is one of China's wealthiest and fastest growing provinces.

Our study focuses on foreign buyout events. We define foreign buyouts as events where a partially foreign-owned company is transformed into a fully foreign owned subsidiary. Compared with increases in equity shareholding or non-equity cooperative arrangements,

¹See Table 3.1.

foreign buyouts represent the most important organizational change for foreign invested firms in China.

5 Econometric Approach

In our study, we estimate the effect of foreign buyouts on firm performance. If we adopted a naive approach of comparing the performance of WOSs to Sino-foreign JVs, we would be ignoring any potential selection bias issues due to the non-randomness of the foreign buyout decision. Instead, when comparing the performance of firms which undergo foreign buyout with those that remain Sino-foreign JVs, we select a control group of firms that do not receive the foreign buyout treatment but have characteristics similar to those of the treated firms. There are numerous firm characteristics that potentially play a role in the foreign buyout decision. However, matching firms based on multiple characteristics creates a dimensionality problem. We simplify the process by employing a matching technique based on propensity scores Rosenbaum and Rubin (1985).

We define a dummy variable $F_{i,t} \in \{0, 1\}$ where $F_{i,t} = 1$ if a Sino-foreign joint venture is taken over by the foreign partner at time t and 0 otherwise. $y_{i,t+u}^1$ denotes firm performance at time $t+u$, u periods after the foreign buyout at time t , where $u \geq 0$. If the JV is not acquired at time t , its performance at time $t+u$ would be equal to $y_{i,t+u}^0$. The effect of a change in ownership structure at time t on firm performance at time $t+u$ is measured by:

$$y_{i,t+u}^1 - y_{i,t+u}^0. \quad (1)$$

$y_{i,t+u}^1$ is readily observed for JVs that experience a foreign buyout, but the counterfactual

$y_{i,t+u}^0$ is not, creating a missing data problem. In general, for any firm one can only observe $y_{i,t+u}^1$ or $y_{i,t+u}^0$, but not both. The average effect of a foreign buyout on firms (the average effect of treatment on the treated) is expressed as:

$$E(y_{t+u}^1 - y_{t+u}^0 | F = 1) = E(y_{t+u}^1 | F = 1) - E(y_{t+u}^0 | F = 1). \quad (2)$$

Researchers often substitute $E(y_{t+u}^0 | F = 0)$ for the counterfactual $E(y_{t+u}^0 | F = 1)$, using the information available for firms that do not receive foreign buyout treatment, for example by adopting a difference-in-differences estimator. However, this approach ignores potential selection bias issues, resulting in bias equal to $E(y_{t+u}^0 | F = 1) - E(y_{t+u}^0 | F = 0)$. A more precise construction of the counterfactual requires careful selection of the control group. There are several time-invariant as well as time-variant firm characteristics that could potentially make a firm a suitable match for a firm that receives foreign buyout treatment.

Matching would work well if both the control and treated firms have the same expected performance if they were Sino-foreign JVs (Rosenbaum and Rubin, 1985). This is known as the conditional independence assumption (CIA), formally:

$$E(y_{t+u}^0 | X, F = 1) = E(y_{t+u}^0 | X, F = 0) = E(y_{t+u}^0 | X), \quad (3)$$

where X is a vector of firm characteristics. For the CIA to be satisfied X should contain all variables that affect both foreign buyout treatment and outcome. The choice of variables to be included in X is guided by theory and institutional knowledge. An additional requirement for matching is that:

$$0 < Pr(F = 1|X) < 1, \quad (4)$$

thus ruling out the perfect predictability of foreign buyouts and ensuring that the comparison group firms fall within the propensity score distribution of the JVs that undergo a foreign buyout. In addition, any short-run general equilibrium effects of foreign buyouts are assumed away. This assumption is plausible since the fraction of firms that change status from Sino-foreign joint ventures to wholly owned subsidiaries in each industry and year is small, minimizing the likelihood of short-run general equilibrium effects on the control group firms.

Matching along all firm characteristics simultaneously creates an intractable dimensionality problem. A more straightforward approach proposed by Rosenbaum and Rubin (1985) is to match firms based on an index capturing the information contained in the relevant variables. The index, also called a propensity score, represents the probability of treatment based on the vector of firm characteristics X :

$$P_i = Pr(F_{i,t} = 1) = F(X_{i,t-1}). \quad (5)$$

Matching is then performed based on the propensity score.

There are several important advantages to matching over standard regression analysis techniques. Matching does not assume a standard linear regression form. Instead, it determines the existence of an appropriate control group and in forming the counterfactual gives positive weight only to those observations that are close enough matches to treated observations.

A standard matching estimator is of the form:

$$\hat{\alpha}_M = \frac{1}{n_1} \sum_{i \in I_1 \cap S_P} [y_i^1 - \hat{E}(y_i^0 | F = 1, P_i)] \quad (6)$$

where

$$\hat{E}(y_i^0 | F = 1, P_i) = \sum_{j \in I_0} W(P_i, P_j) y_j^0. \quad (7)$$

$I_1 \cap S_P$ is the set of treated firms I_1 that fall within the common support S_P . I_0 is the set of control firms and n_1 is the number of treated firms in the support set. W is a weighing function that depends on the propensity score distance between the treated and control firms. The analysis that follows uses a Gaussian kernel weighing function

$$W(P_i, P_j) = \frac{G\left(\frac{P_j - P_i}{a_n}\right)}{\sum_{k \in I_0} G\left(\frac{P_k - P_i}{a_n}\right)}, \quad (8)$$

where G is the Gaussian normal function $G(\alpha) = e^{-\frac{\alpha^2}{2}}$ and a_n is a bandwidth parameter.

Matching eliminates differences between the matched foreign buyout firms and the remaining Sino-foreign joint ventures due to the observable characteristics included in X . However, there might be other systematic differences between the treated and control groups that are not captured by observable characteristics. The difference-in-differences matching estimator alleviates the issue by eliminating unobservable time-invariant differences between the treated and control groups. It differs from the standard difference-in-differences estimator by including only treated firms within the common support and weighing the control firms according to the Gaussian kernel function rather than linearly (Smith and Todd, 2005; Heckman et al., 1997). The difference-in-differences matching estimator takes

the form:

$$\hat{\alpha}_{DDM} = \frac{1}{n_1} \sum_{i \in I_1 \cap S_P} [(y_{i,t+u}^1 - y_{i,t}^1) - \sum_{j \in I_0} W(P_i, P_j)(y_{j,t+u}^0 - y_{j,t}^0)]. \quad (9)$$

The key results discussed in the following sections are based on the difference-in-differences matching estimator.

6 Construction of Variables

The dataset provides information on the country of origin of the foreign investors, the year of entry, the 4-digit industry definition, Chinese and foreign registered capital, Chinese and/or foreign partners, total assets, total debts, total sales, income from services, total profits, number of employees, number of expatriate employees, tax bill, customs payments, imports and exports. We deflated nominal variables using the corresponding industry-specific deflators from China's Statistical Yearbooks.

We construct three dependent variables to capture multiple aspects of performance. First, we use firms' profitability relative to the year and industry mean. Second, we use the ratio of total profits to total assets as a proxy for return on assets (ROA). Lastly, we use the ratio of total profits to total sales as an indicator of the profit rate. Different stakeholders may be interested in different performance indicators. Examining multiple indicators gives us a holistic view of the issue.

The vector of control variables X should include all factors that affect both treatment (foreign buyout) and outcome (performance). The choice of control variables is guided by theoretical priors. The individual significance of control variables is of limited importance,

since variables should be good enough predictors of the event to meet the CIA but not too good, because this would exacerbate the common support problem (Smith and Todd, 2005). We justify the inclusion of these variables as follows.

Total Assets

Total assets capture the size of the firm and control for the impact of capital scale on the probability of foreign buyout. Large total assets may reduce the desire of the foreign MNE to buy out their Chinese partners, because of the substantial financial investment required to complete the transaction. In addition, Sino-foreign joint ventures set up in the 1980s and 1990s are known to have less advanced facilities because of foreign MNEs' concern over unintended technology spillovers. MNEs may be better off engaging in greenfield investment in which they can install upgraded facilities or equipment instead of committing a large amount of financial capital to buy outdated facilities.

Ratio of Sales to Total Assets

The ratio of sales to total assets captures the degree of capital intensity of the firm and controls for the ability of assets to generate income. This variable has no straightforward impact on the decision of foreign buyout since it may vary significantly across different industries, but to the extent that there is variation in the sales to assets ratio within an industry, the ratio could be a determinant of treatment.

Ratio of Total Debt to Total Assets

The ratio of total debt to total assets reflects the degree of leverage of the firm. High debt levels saddle the firm with high interest payments; however, low debt levels may also indicate a credit constraint, i.e. lack of external financial resources. If MNEs have (asymmetric to their Chinese partners) superior internal or external financial resources, this variable can have positive impact on the likelihood of foreign buyout.

Enterprise Age and Age Squared

Firm age reflects the length of JV operations which could be a proxy for learning taking place between the joint venture partners and learning by the foreign partner about the local environment. Previous studies have found some evidence that the longer the foreign invested firm has been in operation in China, the better its performance (Chen, 2008; Child and Yan, 2003). We expect a positive correlation between the age of the firm and the probability of foreign buyout. To control for possible non-linear effects, we also include age squared as a control variable.

Number of Chinese and Foreign Partners

The number of Chinese and foreign partners reflect the dispersion of ownership and management control in the joint venture. Diversity in stakeholders may enrich the venture with the different types of resources and skills needed for market success. But dispersed ownership and/or management control could make the internal coordination expensive and inefficient. In this sense, dispersed ownership should encourage the unification of control by a single stakeholder to reduce inefficiency of multi-party cooperation. However, a practical

difficulty arises when a foreign buyout is attempted: to assume sole control means buying out multiple partners, which could be costly. Theoretically, it is unclear which effect will dominate in practice, but it merits an empirical investigation.

Number of Chinese and Foreign Partners Interacted with Enterprise Age

We include interaction terms of the number of Chinese and foreign partners and firm age in order to control for possible learning effects taking place. Our logic is that the benefits of having multiple partners in the JV may falter over time because of learning effects (Habib and Mella-Barral, 2006). Thus as the number of partners increases and the duration of the JV partnership lengthens, the probability of foreign takeover would increase.

Foreign Ownership Percentage

The foreign ownership percentage measures the control of the foreign MNE over the joint operation. Higher foreign ownership indicates high commitment on the part of the foreign MNE in the joint venture, which in turn may induce the MNE to buy out its Chinese partners in order to assume full control. Therefore we expect this variable to have a positive effect on foreign buyout.

Number of Employees and Labor to Capital Ratio Relative to Industry Mean

The number of employees measures the size of the firm. A high number of employees might signal a large, well established enterprise which potentially could be attractive to foreign buyers. On the other hand, a high labor to capital ratio relative to the industry mean indicates the presence of excess labor and signals potential for costcutting. We would

expect a positive effect of labor as well as the relative labor to capital ratio on the probability of receiving foreign buyout treatment.

Expatriate Dummy

We include an expatriate employee dummy variable as an indicator of foreign MNE involvement in the day to day operations of the firm. Gaur et al. (2007) found that if the general manager position is taken by a foreign partner representative, it reduces labor productivity because of high expatriate compensation cost. Similarly, if the foreign firm employs a high ratio of expatriate employees, its labor productivity suffers. We expect the presence of expatriate employees to negatively affect the foreign firm's performance. However we hypothesize that the effect on the probability of foreign buyout is positive, because the presence of expatriate employees enhances the confidence of the parent MNE that it is capable of managing the joint venture on its own without the participation of a Chinese partner.

Export and Import Dummies

Imports and exports dummy variables capture whether the firm is globally integrated. Although we do not have data on what portions of exports and imports are intra-firm transactions (between the jointly owned venture and the MNE parent company), the two variables should have positive association with the probability of foreign buyout.

Service Income Dummy

The service income dummy indicates if the firm collects income from services. We also include sets of industry and year dummies.

Market Share

We include an industry market share variable measured as the fraction of firm sales in total industry sales. Market share controls for market power. It is likely that foreign MNEs would prefer to buy out firms with higher market power since the potential for higher profit margins would be greater.

7 Results

We organize the results based on the different performance indicators used. First we report our findings when we use profits scaled by the industry average. Next, we turn to results where the outcome variable is return on assets. Lastly, we present the case where the ratio of total profits to total sales is used as the outcome variable.

7.1 Propensity Score Estimation

The propensity score estimation uses the control variables discussed in the previous section and three alternative measures of profitability as the outcome variable: relative profits, return on assets and profits to sales ratio. All control variables are lagged one period. All variables are in natural logarithm form with the exception of ratios, dummy variables, enterprise age and ownership percentage. Table 3.2 presents propensity score estimation

results from the three alternative models. The results are qualitatively consistent with our expectations and consistently stable across the three specifications.

Although the propensity score estimation is merely a means to an end, it is nonetheless instructive to consider the probit estimation results. The interaction term between the number of foreign partners and the age of the JV is positive and significant, consistent with a learning theory of JVs: the more mature the partnership and the higher the number of partners, the more likely the dissolution of the JV. The foreign ownership percentage has a significant positive effect on the probability of foreign buyout, suggesting that high initial commitment on the part of the foreign partner enables a buyout by posing a lower hurdle to full ownership. A high labor to capital ratio relative to the industry mean increases the probability of foreign buyout. To the extent that a relatively high labor to capital ratio signals opportunities for efficiency gains and cost cutting, such enterprises would be particularly attractive for buyouts.

7.2 Balancing Tests

Matching is performed using the Gaussian kernel estimator with a bandwidth of .06. Following Smith and Todd (2005), a trim level of 2% is imposed, below which propensity score densities are excluded from matching. This ensures that outlier observations are not included in the matching procedure. The purpose of the matching process is to define an appropriate control group with which to compare the treated observations. The success of the matching procedure is measured by how closely the treated and matched observations fall to each other on the basis of the observable characteristics included in X and discussed in Section 6 of this chapter. A test proposed by Dehejia and Wahba (2002) checks for the

balancing of the covariates. The observations are stratified so that there is no significant difference in the propensity scores of treated and control firms within a stratum. Then, if for each stratum there are mostly no significant differences between the means of the covariates for the treated and control groups, the propensity score matching is considered balanced. All three versions of our model pass this balancing test.

The absolute standardized bias (ABS) is an alternative measure of the appropriateness of matching. ABS is defined as the difference in the means of the control and treatment group covariates scaled by the square root of the averaged sample variances of the covariates citeprosenbaum. The ABS before matching is given by:

$$ABS = 100 \frac{\frac{1}{n_i} \sum_{i \in I_1} X_i - \frac{1}{n_0} \sum_{j \in I_0} W(P_i, P_j) X_j}{\sqrt{\frac{Var_{i \in I_1}(X_i) + Var_{j \in I_0}(X_j)}{2}}} \quad (10)$$

while the bias after matching is defined as:

$$ABS = \frac{\frac{100}{n_1} \sum_{i \in I_1} [X_i - \sum_{j \in I_0} W(P_i, P_j) X_j]}{\sqrt{\frac{Var_{i \in I_1}(X_i) + Var_{j \in I_0}(X_j)}{2}}} \quad (11)$$

Tables 3.3, 3.5 and 3.7 show the results of balancing tests for each of the three models. The before and after matching ABS is reported at the bottom of each table. Matching greatly reduces the standartized bias, improving the compariability between treated and control group firms. Column 4 of each table reports the percentage reduction in bias for each control variable attained through the matching procedure. The goal is to bring treated and control firms closer together by matching on the propensity score. As is evident in the results reported in column 4, the mean values of the control variables are significantly closer

for the treated and kernel-matched control groups compared with the bias between the treated and unmatched control groups. The matching procedure is enabling us to construct a good quality counterfactual.

7.3 Matching Estimates: Performance Is Measured by Profits Scaled by Average Industry Profits

Difference-in-Differences estimation results of the impact of foreign buyouts on relative profits are presented in Table 3.4. In the first column of each table, t denotes the time period after foreign buyout ($t = 0$ in the period the foreign buyout occurs, $t = 1$ one period after, etc.). The difference-in-differences estimator measures the difference between the treated and control groups in the before and after event change of their relative profits.

The top panel of the table presents the difference-in-differences matching estimates for the treated group and the Gaussian kernel-weighted matched control group. The bottom panel reports results of the before-after difference in profitability between the treated group and the untreated group, where each firm in the untreated group is given equal weight.

There are no significant differences in the relative profit performance of treated and matched firms over the four year period following the foreign buyout event. The differences between treated and matched groups reported in the top panel are smaller in magnitude than the differences between the treated and unmatched control group reported in the bottom panel. Turning to the bottom panel, we find a statistically significant positive effect of foreign buyouts. The discrepancy in results between the top and bottom panel is due to the use of matched versus unmatched control groups. The results further emphasize the importance of constructing an appropriate counterfactual.

7.4 Matching Estimates: Performance is Measured by Return on Assets (ROA)

Difference-in-Differences estimation results of the impact of foreign buyouts on ROA are presented in Table 3.6. The top panel difference-in-differences matching estimates are smaller than the bottom panel simple difference-in-differences estimates. Although there are variations in the coefficients across the two panels, the major results are static. Foreign buyouts do not exert significant impact on the ROA of the firm. This is the case for up to three years after the buyout takes place. The result holds true both with and without matching.

7.5 Matching Estimates: Performance Is Measured by the Ratio of Total Profits to Total Sales

Without matching, the simple difference-in-differences estimates show that firms that receive foreign buyout treatment have significantly lower (at the 1% level of statistical significance) change in their profitability in the year of the buyout when compared with the control group firms. This negative impact diminishes the first year after the buyout takes place, and remains insignificant 2 and 3 years after. However, when we combine the difference-in-differences model with the Gaussian kernel matching weights, this negative and significant impact vanishes. The stark contrast between the two models highlights the pertinence of using propensity score matching to accurately capture the performance implications of foreign buyouts.

8 Discussions and conclusions

This chapter examines the factors affecting whether a JV will be taken over by its foreign partner and the performance implications of such ownership structure transformation. Rather than comparing JVs which have undergone foreign buyouts with the average of the whole population of firms without such transformation, we implement a propensity score matching approach that enables a robust comparison between treated and control groups. The results show that foreign buyouts tend to take place when the JV has a high foreign equity holding and a high number of foreign partners interacted with enterprise age. In addition, we find that JVs with high labor to capital ratios relative to their industry mean are more likely targets for buyouts, because of the potential for efficiency gains through reductions in excess labor.

Comparing before-after differences in performance between JVs which have undergone foreign buyouts and those without such transformation, we find stark contrasts between results generated by simple difference-in-differences estimation techniques and those based on propensity score matching methodology. When we measure performance as profits relative to the industry mean, the simple difference-in-differences estimation shows that JVs which undergo foreign buyouts experience a significant, positive and sustained performance improvement compared with those without such transformation. The seemingly robust results are challenged by the estimation based on the propensity score matching approach, which demonstrates the absence of any significant before-after performance difference between treated and control groups.

We find no significant differences in the return on assets of treated and control group firms regardless of the choice of control group.

In the simple difference-in-differences estimation, we find that foreign buyouts generate immediate negative impact on firm performance, as measured by the ratio of total profits to sales. This negative effect is attenuated over the three years following the event. In contrast, estimation results based on propensity score matching show that the above results are biased. With a more robust comparison between treated and control groups, no significant difference is found in the before-after difference in performance between the treated and control groups.

Our empirical results have highlighted the importance of addressing the selection bias issue inherent in the foreign buyout decision. We have demonstrated that using propensity score matching to establish a reliable comparison between treated and control groups yields new and unexpected results. So does foreign buyout leads to higher performance? The simple answer from our data analysis is no. Nor does it lead to lower performance as our results show.

The results are rather surprising because the literature has conditioned us to expect higher performance after foreign buyouts. We are able to replicate the conventional result in the absence of matching. However, our propensity score matching results suggest that previous studies might find a foreign ownership performance advantage because they ignore the selection bias issue and compare firms with different underlying characteristics. We offer three tentative explanations for the lack of profitability differences between the treated and matched control groups. First, the foreign partner has provided the JV with valuable resources, such as a financial capital injection and technologies before the foreign buyout. As such, the ownership structure transformation from a partial foreign ownership to a full foreign ownership is not sufficient to generate any noticeable performance improvements.

Potential performance improvements may or may not take place over a longer time span, which is difficult to capture in our dataset horizon. A second possibility is that foreign buyouts do not take place at random. Instead, some observable and/or unobservable JV characteristics must have motivated the foreign MNE to buy out its Chinese partners. If these characteristics have causal effect on performance, then foreign buyout will not produce noticeable performance improvements, at least in a relatively short span of time. Lastly, we can recast our results in a different light. Taking the Chinese partners out of the equation does not lead to significant performance differences between Sino-foreign JVs and foreign WOS. We have demonstrated that Chinese partners are not performance barriers or a liability for Sino-foreign JVs. If they were, their being bought out from the JV may have proven immediate performance panacea.

Our study has demonstrated the absence of any immediate performance changes as measured by three alternative profitability variables. However, this does not mean that foreign buyouts should not occur. If the cost of the buyout is relatively low while entitling the MNE to a whole rather than a partial stream of profits, it could still be beneficial for the foreign partner to internalize the JV.

Figures and Tables

Table 1 Top FDI recipient provinces in China 2006 (MOFCOM, 2008)

Rank	Province	FDI US\$ billion
1	Jiangsu	17.34
2	Guangdong	14.51
3	Shandong	10.00
4	Zhejiang	8.89
5	Fujian	7.18
6	Shanghai	7.10

Table 2 Probit Estimation of the Propensity Score Using Various Measure of Profitability As Outcome Variable. Column 1 uses Profits Relative to Industry Mean, Column 2 uses Return on Assets and Column 3 uses Profits to Sales Ratio.

	(1)	(2)	(3)
Lag Profits Rel. to Industry Mean	-0.00 (0.00)		
Lag Return on Assets		0.25 (0.51)	
Lag Profits to Sales Ratio			0.00 (0.01)
Lag Log Real Total Assets	0.05 (0.05)	0.05 (0.05)	0.09 (0.05)
Lag Sales to Total Assets Ratio	-0.04 (0.06)	-0.05 (0.07)	-0.02 (0.04)
Lag Total Debt to Total Assets Ratio	-0.02 (0.07)	-0.01 (0.07)	-0.06 (0.16)
Lag Firm Age	-0.08 (0.06)	-0.08 (0.06)	-0.04 (0.07)
Lag Firm Age Squared	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Lag Number of Chinese Investors	-1.28 (1.47)	-1.29 (1.46)	-1.35 (1.47)
Lag Number of Chinese Investors Squared	0.26 (0.46)	0.26 (0.45)	0.30 (0.45)
Lag Number of Chinese Investors x Firm Age	0.01 (0.04)	0.01 (0.04)	0.01 (0.04)
Lag Number of Foreign Investors	-0.90 (1.17)	-0.81 (1.18)	-0.76 (1.19)
Lag Number of Foreign Investors Squared	0.03 (0.34)	0.01 (0.35)	0.02 (0.35)
Lag Number of Foreign Investors x Firm Age	0.07* (0.04)	0.07* (0.04)	0.06 (0.04)
Lag Foreign Ownership Percent	2.12*** (0.26)	2.11*** (0.26)	2.15*** (0.27)
Lag Labor to Capital Ratio Rel. to Industry Mean	0.00*** (0.00)	0.00*** (0.00)	0.00*** (0.00)
Lag Log Number of Employees	0.03 (0.07)	0.03 (0.07)	0.01 (0.07)
Lag Expat Workers Dummy	0.16 (0.13)	0.16 (0.13)	0.13 (0.14)
Lag Imports Dummy	0.08 (0.16)	0.08 (0.16)	0.02 (0.17)
Lag Exports Dummy	-0.04 (0.15)	-0.04 (0.15)	-0.01 (0.16)
Lag Service Income Dummy	0.28 (0.35)	0.29 (0.36)	0.28 (0.37)
Lag Market Share	1.53 (1.56)	1.45 (1.56)	1.08 (1.57)
Number of Observations	1252	1246	1160
Pseudo R2	0.20	0.20	0.21

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3 Balancing Tests from Kernel Matching: Performance Is Measured by Profits Scaled by Industry Mean Profits

Variable	Sample	Mean		% Bias	% Reduc Bias	t-test	
		Treated	Control			t	p > t
Lag Log Real Total Assets	Unmatched	7.33	7.18	6.50		0.75	0.45
	Matched	7.49	7.49	-0.20	97.40	-0.01	0.99
Lag Profits Rel. to Industry Mean	Unmatched	1.11	0.61	2.10		0.20	0.84
	Matched	1.08	-0.47	6.60	-206.60	0.30	0.76
Lag Sales to Total Assets Ratio	Unmatched	1.05	13.62	-4.20		-0.31	0.76
	Matched	1.05	5.86	-1.60	61.70	-0.18	0.85
Lag Total Debt to Total Assets Ratio	Unmatched	0.54	0.65	-10.40		-0.77	0.44
	Matched	0.55	0.58	-3.00	70.60	-0.29	0.78
Lag Labor to Capital Ratio Relative to Industry Mean	Unmatched	3763.40	419.72	19.80		4.13	0.00
	Matched	854.43	414.88	2.60	86.90	0.54	0.59
Lag Firm Age	Unmatched	5.65	5.32	8.30		0.84	0.40
	Matched	5.57	5.44	3.40	59.80	0.23	0.82
Lag Firm Age Squared	Unmatched	48.03	43.56	8.30		0.86	0.39
	Matched	46.83	45.86	1.80	78.20	0.12	0.90
Lag Number of Chinese Investors	Unmatched	1.06	1.16	-29.90		-2.53	0.01
	Matched	1.06	1.10	-11.60	61.20	-0.90	0.37
Lag Number of Chinese Investors Squared	Unmatched	1.19	1.53	-27.60		-2.35	0.02
	Matched	1.20	1.34	-11.40	58.60	-0.87	0.38
Lag Number of Chinese Investors x Firm Age	Unmatched	6.17	6.32	-2.60		-0.25	0.80
	Matched	6.12	6.31	-3.00	-18.90	-0.20	0.84
Lag Number of Foreign Investors	Unmatched	1.10	1.12	-5.20		-0.48	0.63
	Matched	1.10	1.12	-5.20	-0.80	-0.38	0.71
Lag Number of Foreign Investors Squared	Unmatched	1.33	1.40	-6.20		-0.57	0.57
	Matched	1.32	1.38	-5.00	18.70	-0.37	0.71
Lag Number of Foreign Investors x Firm Age	Unmatched	6.55	5.96	10.70		1.13	0.26
	Matched	6.40	6.26	2.60	75.80	0.17	0.86
Lag Foreign Ownership Percent	Unmatched	0.66	0.45	95.50		10.14	0.00
	Matched	0.66	0.61	24.40	74.50	1.57	0.12
Lag Log Number of Employees	Unmatched	4.41	4.23	15.70		1.48	0.14
	Matched	4.37	4.38	-0.70	95.20	-0.05	0.96
Lag Expat Workers Dummy	Unmatched	0.37	0.24	30.20		3.17	0.00
	Matched	0.35	0.33	4.00	86.90	0.27	0.79
Lag Imports Dummy	Unmatched	0.34	0.24	21.90		2.27	0.02
	Matched	0.34	0.32	3.60	83.50	0.24	0.81
Lag Exports Dummy	Unmatched	0.42	0.32	20.80		2.11	0.04
	Matched	0.41	0.39	5.10	75.30	0.36	0.72
Lag Service Income Dummy	Unmatched	0.04	0.02	11.60		1.35	0.18
	Matched	0.04	0.03	7.00	39.50	0.45	0.66
Lag Market Share	Unmatched	0.03	0.01	26.80		4.29	0.00
	Matched	0.02	0.02	-1.80	93.30	-0.15	0.88
Number of Firms		107	1145				
Number of Firms on Support		100	1145				
Median ABS	Unmatched	11.55					
	Matched	4.19					

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4 Impact of Foreign Buyout on Profits Scaled by Industry Mean Profits

t	Profits Rel. to Industry Mean			Common Support		Off Support	
	Matching Estimate	Std. Err.	T-Stat	Untreated	Treated	Untreated	Treated
Difference-in-differences combined with Gaussian kernel matching estimates							
0	5.53	6.43	0.86	1145	100	0	7
1	0.03	1.62	0.02	757	80	0	5
2	3.04	5.73	0.53	555	64	0	2
3	-1.06	2.23	-0.5	377	50	0	2
Simple difference-in-differences estimates							
0	6.51	1.79	3.64***	1145	107	0	0
1	2.73	3.91	0.70	757	85	0	0
2	5.30	2.05	2.59***	555	66	0	0
3	1.02	1.25	0.82	377	52	0	0

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5 Balancing Tests from Kernel Matching: Performance Is Measured by Return on Assets

Variable	Sample	Mean		% Bias	% Reduc Bias	t-test	
		Treated	Control			t	$p > t $
Lag Log Real Total Assets	Unmatched	7.33	7.18	6.70		0.78	0.44
	Matched	7.37	7.34	1.40	79.50	0.09	0.93
Lag Return on Assets	Unmatched	0.04	0.01	18.60		1.83	0.07
	Matched	0.04	0.02	10.10	45.50	0.73	0.47
Lag Sales to Total Assets Ratio	Unmatched	1.05	13.69	-4.30		-0.31	0.76
	Matched	1.06	5.96	-1.70	61.20	-0.19	0.85
Lag Total Debt to Total Assets Ratio	Unmatched	0.54	0.65	-10.50		-0.78	0.43
	Matched	0.55	0.58	-3.20	69.50	-0.30	0.76
Lag Labor to Capital Ratio Rel. to Industry Mean	Unmatched	3763.40	421.92	19.80		4.12	0.00
	Matched	1970.30	1234.30	4.40	78.00	0.46	0.64
Lag Firm Age	Unmatched	5.65	5.35	7.80		0.78	0.44
	Matched	5.54	5.42	2.90	63.10	0.20	0.84
Lag Firm Age Squared	Unmatched	48.03	43.79	7.90		0.81	0.42
	Matched	46.73	45.50	2.30	71.10	0.15	0.88
Lag Number of Chinese Investors	Unmatched	1.06	1.16	-29.80		-2.53	0.01
	Matched	1.06	1.10	-10.90	63.50	-0.85	0.40
Lag Number of Chinese Investors Squared	Unmatched	1.19	1.53	-27.60		-2.35	0.02
	Matched	1.20	1.34	-10.60	61.50	-0.82	0.41
Lag Number of Chinese Investors x Firm Age	Unmatched	6.17	6.35	-3.00		-0.30	0.77
	Matched	6.09	6.26	-2.70	11.50	-0.17	0.86
Lag Number of Foreign Investors	Unmatched	1.10	1.12	-4.90		-0.46	0.65
	Matched	1.10	1.12	-4.40	10.50	-0.32	0.75
Lag Number of Foreign Investors Squared	Unmatched	1.33	1.40	-5.90		-0.55	0.59
	Matched	1.32	1.38	-4.30	27.90	-0.32	0.75
Lag Number of Foreign Investors x Firm Age	Unmatched	6.55	5.99	10.20		1.08	0.28
	Matched	6.37	6.23	2.60	74.70	0.17	0.86
Lag Foreign Ownership Percent	Unmatched	0.66	0.45	95.40		10.14	0.00
	Matched	0.65	0.60	22.00	76.90	1.41	0.16
Lag Log Number of Employees	Unmatched	4.41	4.22	15.80		1.50	0.14
	Matched	4.38	4.36	2.40	84.70	0.17	0.87
Lag Expat Workers Dummy	Unmatched	0.37	0.23	30.60		3.21	0.00
	Matched	0.34	0.33	3.00	90.30	0.20	0.84
Lag Imports Dummy	Unmatched	0.34	0.24	22.10		2.29	0.02
	Matched	0.33	0.31	5.30	75.90	0.36	0.72
Lag Exports Dummy	Unmatched	0.42	0.32	20.40		2.07	0.04
	Matched	0.41	0.37	8.80	57.10	0.61	0.55
Lag Service Income Dummy	Unmatched	0.04	0.02	11.50		1.34	0.18
	Matched	0.04	0.03	7.10	38.00	0.45	0.65
Lag Market Share	Unmatched	0.03	0.01	26.70		4.28	0.00
	Matched	0.02	0.02	-1.40	94.80	-0.12	0.91
Number of Firms		107	1,139				
Number of Firms on Support		99	1,139				
Median ABS	Unmatched	11.87					
	Matched	4.30					

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 Impact of Foreign Buyout on Total Profits to Total Assets Ratio

t	Total profits to total assets ratio			Common Support		Off Support	
	Matching Estimate	Std. Err.	T-Stat	Untreated	Treated	Untreated	Treated
Difference-in-differences combined with Gaussian kernel matching estimates							
0	0.20	0.22	0.91	1139	99	0	8
1	0.01	0.02	0.50	752	80	0	5
2	-0.01	0.02	-0.50	549	63	0	3
3	-0.00	0.02	-0.00	372	50	0	2
Simple difference-in-differences estimates							
0	0.30	0.93	0.32	1139	107	0	0
1	0.02	0.02	1.02	752	85	0	0
2	0.01	0.02	0.28	549	66	0	0
3	-0.00	0.02	0.00	372	52	0	0

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7 Balancing Tests from Kernel Matching: Performance Is Measured by Total Profits to Sales Ratio

Variable	Sample	Mean		% Bias	% Reduc. Bias	t-test	
		Treated	Control			t	p > t
Lag Log Real Total Assets	Unmatched	7.42	7.22	8.90		0.98	0.33
	Matched	7.58	7.65	-3.10	65.60	-0.23	0.82
Lag Profits to Sales Ratio	Unmatched	-0.78	-0.73	-0.50		-0.04	0.97
	Matched	-0.82	-0.62	-2.00	-333.70	-0.16	0.87
Lag Sales to Total Assets Ratio	Unmatched	1.10	14.72	-4.40		-0.31	0.75
	Matched	1.10	6.15	-1.60	62.90	-0.18	0.85
Lag Total Debt to Total Assets Ratio	Unmatched	0.57	0.66	-10.50		-0.76	0.45
	Matched	0.58	0.59	-1.80	83.30	-0.18	0.86
Lag Labor to Capital Ratio Rel. to Industry Mean	Unmatched	3832.70	441.19	19.60		3.92	0.00
	Matched	727.80	335.56	2.30	88.40	0.49	0.63
Lag Firm Age	Unmatched	5.92	5.43	12.50		1.21	0.23
	Matched	5.98	5.69	7.30	42.00	0.50	0.62
Lag Firm Age Squared	Unmatched	50.52	44.60	10.90		1.08	0.28
	Matched	51.42	48.17	6.00	45.20	0.39	0.70
Lag Number of Chinese Investors	Unmatched	1.06	1.16	-27.70		-2.32	0.02
	Matched	1.06	1.10	-9.30	66.40	-0.72	0.47
Lag Number of Chinese Investors Squared	Unmatched	1.20	1.51	-25.50		-2.14	0.03
	Matched	1.21	1.32	-9.20	63.90	-0.69	0.49
Lag Number of Chinese Investors x Firm Age	Unmatched	6.47	6.46	0.10		0.01	0.99
	Matched	6.55	6.54	0.20	-214.20	0.01	0.99
Lag Number of Foreign Investors	Unmatched	1.11	1.12	-3.80		-0.35	0.73
	Matched	1.11	1.13	-3.80	-1.40	-0.27	0.79
Lag Number of Foreign Investors Squared	Unmatched	1.35	1.41	-5.10		-0.46	0.65
	Matched	1.36	1.41	-3.80	25.10	-0.27	0.78
Lag Number of Foreign Investors x Firm Age	Unmatched	6.87	6.09	14.00		1.43	0.15
	Matched	6.98	6.58	7.10	49.10	0.46	0.64
Lag Foreign Ownership Percent	Unmatched	0.67	0.45	95.80		9.94	0.00
	Matched	0.67	0.62	20.50	78.60	1.28	0.20
Lag Log Number of Employees	Unmatched	4.46	4.30	14.80		1.37	0.17
	Matched	4.42	4.47	-4.00	73.00	-0.27	0.78
Lag Expat Workers Dummy	Unmatched	0.38	0.24	29.60		3.00	0.00
	Matched	0.36	0.35	3.60	87.90	0.24	0.81
Lag Imports Dummy	Unmatched	0.34	0.24	20.30		2.04	0.04
	Matched	0.34	0.34	1.10	94.40	0.07	0.94
Lag Exports Dummy	Unmatched	0.44	0.34	19.70		1.93	0.05
	Matched	0.43	0.40	4.80	75.40	0.33	0.74
Lag Service Income Dummy	Unmatched	0.04	0.02	11.60		1.31	0.19
	Matched	0.04	0.03	6.60	42.90	0.42	0.68
Lag Market Share	Unmatched	0.03	0.01	27.30		4.21	0.00
	Matched	0.02	0.02	-4.90	81.90	-0.42	0.68
Number of Firms		101	1,059				
Number of Firms on Support		96	1,059				
Median ABS	Unmatched	11.67					
	Matched	4.54					

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8 Impact of Foreign Buyout on Total Profits to Sales Ratio

t	Total profits to sales ratio			Common Support		Off Support	
	Matching Estimate	Std. Err.	T-Stat	Untreated	Treated	Untreated	Treated
Difference-in-differences combined with Gaussian kernel matching estimates							
0	-2.13	2.23	-0.96	1059	96	0	5
1	-1.07	1.56	-0.69	711	78	0	4
2	0.07	0.09	0.78	522	60	0	2
3	-0.00	0.08	-0.00	362	48	0	2
Simple difference-in-differences estimates							
0	-1.98	0.70	-2.83***	1066	103	0	0
1	-0.94	1.07	-0.88	717	84	0	0
2	0.14	0.27	0.49	527	66	0	0
3	0.01	0.15	0.10	362	50	0	0

* significant at 10%; ** significant at 5%; *** significant at 1%

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