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A Fire Sale without Fire: An Explanation of Labor-Intensive FDI in China

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Abstract

Using a large firm-level panel dataset from the Chinese National Bureau of Statistics, we examine the effect of financial distortions on FDI inflows in China's labor-intensive industries. Following Whited and Wu (2006), we estimate the investment Euler equation and construct a financing constraint index for each firm. We find that among domestic firms, the financing constraint index is highest for private firms and lowest for state-owned firms. This finding is consistent with the political pecking order hypothesis that states that there is a severe lending bias in China's financial system against private firms in favor of state-owned enterprises. Then we estimate a probit model of joint-venture decisions by private firms. We show that firms with greater financing constraints are more likely to be acquired and controlled by foreign firms. We interpret this evidence to be consistent with the fire-sale hypothesis that states that private firms relinquish their equity and control to foreign investors in order to raise financing for growth. We find that those firms in the top 25 percent of the most financing constraints could have avoided losing 31.5 percent of the equity share to foreigners had they faced the same favorable financing constraints as a typical firm in Zhejiang Province.

Keywords: FDI, China, Fire Sale
JEL Classification: F21, L14, O53

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1. Introduction

In a widely used textbook on foreign direct investment (FDI), Richard Caves writes, "MNEs [multinational enterprises] are logically incompatible with the purely competitive organization of an industry." The reason is, as Caves observes, a "purely competitive industry has ample new local entrants to compete down the windfall profits in the foreign market" (Caves 1996, p. 25). Despite this theoretical prediction, FDI has been massive in China's labor-intensive industries. According to one estimate, about 50 percent of China's FDI inflows in the late 1990s went into labor-intensive manufacturing industries (Tseng and Zebregs, 2002). In 2005, the textile and garment industry—the industry on which our paper focuses—received a total of US$ 2.9 billion in FDI (almost 5% of China's total FDI inflows that year), most of which came from Hong Kong, Macao, and Taiwan (HMT) investors.[1] This paper examines why labor-intensive FDI is so substantial in China.

The hypothesis we propose—and provide evidence to support—is that the financing constraints facing private garment producers in China are the principal factor driving up labor-intensive FDI. This explanation for labor-intensive FDI is consistent with the "fire-sale" hypothesis of foreign acquisitions that was first proposed by Krugman (2001) and more recently substantiated empirically by Aguiar and Gopinath (2005). Krugman observed that direct investment into Asian countries during the financial crisis surged at a time when foreign capital in general was fleeing these countries. He coined the word "fire-sale FDI" to describe foreign takeovers of domestic assets when the asset value is deeply discounted. The difference between our paper and previous research on fire-sale FDI is that the financing constraints in our paper are not induced by an exogenous shock—such as a financial crisis—but by the distortions in the Chinese financial system. These distortions take the form of capital allocations on the basis of a political—as opposed to commercial—pecking order of firms that privileges the least efficient state-owned enterprises (SOEs) at the expense of the most efficient private firms.

[1] Source: *Zhongguo waishang touzi baogao 2006* (China FDI Report 2006) (Beijing: Ministry of Commerce, 2006), chap. 4.

To examine the effect of the financing constraints of private firms on labor-intensive FDI, we use a large firm-level panel dataset of the garment industry from the Chinese National Bureau of Statistics. Our data include all state-owned firms and all non-state firms with sales above 5 million yuan. This dataset is supplemented by a comprehensive private-firm survey conducted by the All-China Federation of Industry and Commerce in 2000.

We focus on the garment industry rather than on all manufacturing industries because we want to control for those FDI determinants postulated by the industrial organization economists. The garment industry is a good example to illustrate how the financing constraints of Chinese private firms affect FDI inflows. First, there are standard and proven methods to solve buyer/seller disputes and quality problems without resorting to integration. Foreign buying firms and domestic suppliers coordinate closely on a range of operating decisions, including quality control, selection of suppliers, the use of equipment, designs and specifications, etc.[2]

Although brand names are important in the retail stage of the industry, garment manufacturing relies on simple and nonproprietary technology. The conventional argument that foreign firms need to possess firm-specific technology or know-how advantages is less relevant here. Second, the garment industry is highly competitive. Those factors that are normally related to hold-up and opportunism problems by and large are absent in this industry. In such a labor-intensive and technology-simple industry, subcontracting should generate as many benefits as equity investment. For this and other reasons, contract production proved to be a highly successful business method. FDI, which is a form of equity production, was fairly small in the historically successful garment-exporting economies of South Korea, Taiwan, and Hong Kong (Huang 2003).

As an additional control of the technological determinants of FDI, we limit our analysis to joint ventures with firms based in Hong Kong, Macao, and Taiwan. The three

[2] As Woodruff (1998, pp. 984-985) observed on the footwear industry in Mexico:
"Most important, both manufacturers and retailers recognized the right of retailers to inspect delivered merchandise for adherence to the order and for defective workmanship. Without this right, a manufacturer's incentives to produce products of quality workmanship would have been significantly reduced."

economies collectively accounted for about 40 percent of China's overall FDI during the sample period. Compared with non-HMT foreign firms (mostly OECD firms), HMT firms generally lack advanced technology and internationally recognized brand names (Tong, 2005). Limiting our sample to HMT firms in the garment industry thus has the effect of making the supply side of FDI as homogenous as possible. Any observed variations in the level of the FDI dynamics in our empirical estimations are then attributed to the demand-side influences.

To test for the political pecking order hypothesis, following Whited and Wu (2006), we estimate an investment Euler equation and construct a financing constraint index for each firm. We further examine the pattern of the financing constraint index across different ownerships. We find the following order of the financing constraint index from highest to lowest: private firms, collective firms, state-owned enterprises, and foreign firms. This finding is consistent with the political pecking order hypothesis whereby there is a severe lending bias in China's financial system against private firms in favor of state-owned firms.

In the next step, we estimate a probit model of joint-venture decisions by private firms. We find that financing constraints play an important role in a domestic private firm's decision whether or not to form a joint venture—i.e., whether to share the claims on future profits— with an HMT firm. In our empirical estimations, we go beyond the binary decision whether or not to share equity and study the effect of financing constraints on the extent the equity is shared with foreign firms and on the extent the control rights of the firm are ceded to a foreign firm. To study the effect of the financing constraints on the transfer of control rights in joint ventures, we also estimate several specifications of the ordered probit model.

To reduce the impact of endogeneity problem, in our estimation of probit and ordered probit models, all the independent variables precede the dependent variable by one year. As further robustness controls, we replace the WW index by the average WW index in the past 3 years. We also use alternative measure for the dependent variable, the regional

financing constraint measure, which is calculated as the private sector's ratio of non-bank loans to the total debt at the city level.

Our estimation shows that, net of the normal business and economic dynamics that tilt toward foreign controls, greater financing constraints inflicted by the Chinese financial system on a private firm are associated with a larger foreign equity share and a greater probability of foreign majority control of that firm. Through a unique feature of our dataset which allows us to know the identity of a firm's chairman of the board or its CEO (called a legal person representative in Chinese law), we are able to show that greater financing constraints are associated with a greater likelihood of the termination of the current legal person representative, most likely the founding entrepreneur of the firm. Financing biases thus contribute to a loss of corporate control by the indigenous Chinese entrepreneurs. These are the welfare implications from our analysis.

The remainder of the paper is organized as follows. We review the literature and develop the empirical hypotheses in Section 2. Section 3 describes the data. Section 4 discusses the methodology to estimate the financing constraint index. We test our two main hypotheses regarding the political pecking order of financing constraints and the formation of joint-venture decisions by private firms in Sections 5 and 6 respectively. The paper concludes with Section 7.

2. Literature Review and Empirical Hypotheses

Traditional FDI theory is based on an ownership-location-internalization paradigm (Hymer 1976; Caves, 1998; Dunning 1990). Recent FDI theories emphasize the nature of incomplete contracts for know-how investment in which multinational enterprises (MNEs) will only have an incentive to invest in a host country if the MNEs can own the assets (Grossman and Hart, 1986; Hart and Moore, 1990; Antras and Helpman, 2004; Helpman, 2006). However, these theories cannot fully explain labor-intensive FDI in China (or anywhere else). The garment industry is labor-intensive and highly competitive.

Technological entry barriers are relatively low and market power, although not insignificant in the retail segment of the value chain, is mostly absent in the manufacturing stage.

Our explanation of pervasive labor-intensive FDI in China is an extension of Huang (2003). We have the following two central hypotheses. The first hypothesis is that what Huang (2003) calls the political pecking order of firms in China systematically disadvantages indigenous private firms in the form of severe and persistent credit constraints. The policy of the Chinese government allocates precious financial resources and business opportunities according to a political rather than a commercial pecking order of firms. Because of government interference in Chinese banks — especially the requirement that banks fund state-owned enterprises — the domestic financial sector privileges the least efficient state-owned enterprises and deprives the emerging private enterprises of access to bank funding. Studies of the Chinese economy document the severe financing constraints faced by Chinese private-sector firms. For example, according to an IFC report (Gregory et al., 2000), which uses data published by the People's Bank of China, loans made to private firms accounted for less than 1 percent of total loans in 1998.

It remains puzzling how, given this severe financing constraint, Chinese private-sector businesses have managed to grow. One explanation hinges on informal finance (Allen, Qian and Qian 2005). We offer another hypothesis here—credit-constrained private entrepreneurs accessed equity capital from foreign firms by forming joint ventures with them. This is the main hypothesis to be explored in this paper—how financing constraints on private-sector firms serve to induce labor-intensive FDI.

The observation that financially constrained domestic firms can be taken over by foreign firms can be traced back to the 1970s. Reuber and Roseman (1972, p. 492) report that foreign mergers are negatively correlated to the supply of funds generated internally in Canadian firms, i.e., foreign mergers are positively related to the financing constraints of Canadian firms. McKinnon (1972, p.516) points out that the "impact on merger activity

of an internal financing constraint within Canadian firms was particularly interesting." Then he suggests that a less-developed economy with a more primitive banking system is more prone to foreign takeovers. A more recent strand of the literature on FDI focuses on the role of crises. Krugman (2001) formally proposed the theory of fire-sale FDI to explain the constant inflow of FDI to the crisis economies in Asia, especially to the liquidity-constrained local firms.[3] Blonigen (1997) shows that a depreciation of a host country's currency will generate a fire sale of transferable assets to foreign firms. Aguiar and Gopinath (2005) suggest that when the financial crisis tightened the liquidity constraints of Asian firms, foreign investors quickly captured the opportunity and expanded their market shares.[4]

Another treatment is to ascertain the financial impact of FDI on domestic firms. Using firm-level data from the Ivory Coast, Harrison and McMillan (2003) find that when foreign firms borrow heavily from domestic banks, they crowd out local firms from the domestic capital markets. However, in a cross-country study, Harrison, Love, and McMillan (2004) show that FDI inflows are associated with a reduction in firm-level financing constraints.

Our paper is related to but also substantially distinct from these "fire-sale" or "crowding-out" papers. Our view that labor-intensive FDI is induced by financing constraints implies that there are "fire-sale" dimensions to our explanation. The difference, however, is that we focus on an equilibrium state—steady-state policy and institutional biases—as opposed to a sudden and deep macroeconomic shock. This is a fire sale but without the fire, so to speak. Another difference is our empirical focus. The firms in our dataset are relatively small and they engage in simple, labor-intensive manufacturing, as opposed to publicly-listed firms on the stock markets. A corollary of this empirical focus is that we cannot directly demonstrate the discount effect of the fire sale even though the underlying dynamics are quite similar to those described in the literature.

[3] In earlier research motivated by the industry-equilibrium model of asset liquidation of Shleifer and Vishny (1992), Pulvino (1998) find that capital-constrained airlines in the U.S. are more likely to sell used aircraft to industry outsiders, especially during industry recessions.

[4] Exchange rate changes as a driver of FDI are also featured in the work by Froot and Stein (1991).

Our paper differs from Harrison and McMillan (2003) and Harrison, Love, and McMillan (2004) in that we model FDI as an effect, rather than a contributing cause, of local financing. We uncover some of the similar empirical regularities reported by Guariglia and Poncet (2008). However, our paper is based on a substantially more disaggregated dataset and, because of the panel nature of our data, we are able to produce a far cleaner demonstration of the causal mechanisms.

3. The Data

Our main dataset is from the annual census of above-size manufacturing firms conducted by the National Bureau of Statistics (NBS) of China from 2001 to 2005.[5] We supplement this dataset with a private-firm survey conducted by the All-China Federation of Industry and Commerce in the year 2000 (mainly to produce an alternative index of the financing constraints). The NBS firm-level census data include all state-owned firms and all non-state firms with sales revenue over 5 million yuan. The industry section of the *China Statistical Yearbook* is compiled based on this dataset. The dataset contains detailed information for over 100 variables, including firm ID, address, ownership, four-digit industry code, six-digit geographic code, as well as detailed financial information. The firms in our sample accounted for 60 percent of the total industrial value added in 2001 and 94 percent in 2005.[6] We delete those observations with missing values and those that fail to satisfy some basic error checks. We deflate the firm value added with an industry-specific ex-factory price index. The capital stock is the net value of the fixed assets deflated by the investment price index. The deflators of output and capital stock are calculated based on the price information in the *China Statistical Yearbook* (2006).

Previous work on the connections between financing constraints and FDI relies on cross-sectional data. The endogeneity problems are severe. We cannot distinguish between the financing constraint hypothesis—that the financing constraints induced FDI—from the

[5] The entire dataset is from 1998 to 2005. We choose to focus on the 2001-2005 sample for two reasons: (1) R&D expenditure is only available after 2001; (2) We want to match with the 2000 private-sector survey..
[6] This is calculated by dividing the total value added in the dataset by the industrial GDP in the *China Statistical Yearbook* (2006).

crowding-out hypothesis which postulates that foreign firms draw financial resources away from local firms. A huge advantage of our dataset is that a large number of firms appear in multiple years in the dataset, which allows us to know the financing treatment of a firm prior to its decision to form a joint venture. We construct a panel dataset by matching these firms across different years. In our dataset, each firm has a unique numerical ID—called legal person code—assigned by the Chinese government at the time the firm was founded. We use this information to match firms across different years. However, the firm ID may change over time if the firm underwent restructuring, merger, or acquisition. Therefore, in addition to matching by IDs, we also match the firms by using several of the following firm attributes: firm name, founding year, geographic code, industry code, phone number, name of legal person representative, and address. This procedure minimized the errors from matching firms across different years.

We calculate the Herfindahl index, capital-labor ratio, and the ratio of value added to total output value for all 4-digit industries. Sorting the industries (ascending) by these variables, we find that the garment industry ranks no.1 among all 4-digit industries in all three cases, which confirms that the garment industry is the most competitive, labor-intensive industry in China during the sample period.

The financing constraint index constructed in this paper owes its origins to Whited and Wu (2006). Based on the Euler equation approach, the GMM estimator is applied to test and construct the firm-level financing constraint index for the private firms in the garment industry. For details, see Section 4 below.

As an alternative measure for the financing constraint, we use a private firm survey jointly conducted by the United Front Work Department of the Central Committee of the Communist Party of China, the All-China Industry and Commerce Federation, and the Society of Private Economy at the Chinese Academy of Social Sciences. The private firm survey covers 3,073 private firms in 2000. The survey included questions about total debts and the share of bank loans in total debts. We calculate the firm-level ratios of non-bank loans to the total debt as our alternative financing constraint index. The assumption

behind this measure is that loans from the formal financial sector are always cheaper than what a firm can obtain from the informal financial sector. [7]

We then aggregate these firm-level non-bank loan ratios to the 4-digit municipal level in order to obtain a more precise measure of the financial treatment of private firms as compared with the usual 2-digit provincial measure in the literature. Because the measure is at the level of municipality, it reflects the financing constraint that an average private firm faces in that municipality rather than the specific constraints faced by the firms in the NBS dataset. Using the 6-digit regional codes in the NBS dataset, we are able to match the two datasets. Altogether, about 8,100 firms in the NBS dataset—out of a total of 11,402 private firms—are located in those municipalities covered by the 2000 private-sector survey.

Table 1 provides the summary statistics for all the key variables used in this paper. The full sample size is 11,402 private garment firms. The first row of Table 1 shows that among these 11,402 private firms, 26 percent formed new joint ventures with foreign investors from Hong Kong, Macao, and Taiwan over the sample period of 2001 to 2005. All these private firms experienced different levels of financing constraints. The Whited-Wu (WW) index shows that the lowest level of a financing constraint for a firm is 0.64, and the highest is 1.67. None of the firms are not financially constrained, as would have been implied by achieving a WW index of zero. The alternative measure for the financing constraint, given by the ratio of non-bank loans to total debt at the regional level, ranges from zero to one, which also exhibits various levels of financing constraints in different regions.

Table 1 shows the heterogeneous levels of the total factor productivity (lnTFP), export share, and R&D expenditure of the private garment firms in the sample. Because we have an unbalanced panel of firms, we calculate the TFP by the Levinsohn and Petrin (2003) semi-parametric procedure, which uses intermediate inputs as a proxy for the

[7] Non-bank informal loans in China are always associated with much higher interest costs. A *New York Times* article describes the situation in the following terms: "More and more families with savings have been snubbing 2 percent interest on bank deposits for the double-digit returns from lending large amounts on their own. They lend to real estate speculators or to small businesses without the political connections to obtain loans from the banks." *New York Times*, November 9, 2004.

unobservable productivity shock to address the underlying input endogeneity issue. The Levinsohn-Petrin procedure is implemented using the Stata module "levpet" developed by Petrin, Levinsohn, and Poi (2004). Finally, Table 1 presents the provincial GDP per capita in logs and the provincial lawyer density where the firms are located, two variables that denote the investment environment of the Chinese provinces.

4. Estimating the Financing Constraint Index

Following the pioneering work of Fazzari, Hubbard and Petersen (1988), there have been two common approaches to estimating the extent of financing constraints: the Q-theory model and the Euler equation. Both approaches are based on the same dynamic optimization theory of investment, but they differ in the way they rearrange the first-order conditions. However, it is more data-demanding to estimate the Q-theory model than to estimate the Euler equation. The marginal q is unobservable and a proxy has to be found in the Q-model by, for example, the market valuation of capital. In many developing countries, the financial markets are imperfect and therefore it is difficult to obtain a good estimation of the market valuation of capital. The Q-model is also subject to a measurement error and identification problems (see Kaplan and Zingales 1997; Erickson and Whited, 2000; Love, 2003). Therefore, the Euler equation approach is the preferred estimation of financing constraints in the context of developing countries. We adopt the Euler approach in this paper.

Suppose firm *i* is to maximize the expected discounted value of the dividends subject to the dividends identity and capital accumulation constraints:

$$V_{it} = \max D_{it} + E_{it} \sum_{s=1}^{\infty} \beta_{t+s-1} D_{i,t+s} \qquad (1)$$

subject to

$$D_{it} = \pi(K_{it}, u_{it}) - C(I_{it}, K_{it}) - I_{it} + B_{i,t+1} - (1 + r_t) B_{it} \qquad (2)$$

$$K_{i,t+1} = I_{it} + (1 - \delta_i) K_{it} \qquad (3)$$

where V_{it} is the value of firm i at time t, E_{it} is the expectation operator, β_{t+s-1} is the discount factor from time $t+s$ to time t. Equation (2) defines the firm's dividends D_{it} and equation (3) governs the capital stock accumulation K_{it}. $\pi(K_{it}, u_{it})$ is the restricted profit function that is maximized with respect to variable costs, u_{it} is the productivity shock, $C(I_{it}, K_{it})$ is the real adjustment cost of investment, I_{it} is the investment expenditure of the firm, B_{it} and r_t are the stock of debt and the coupon rate on the debt, respectively, and δ_i is the depreciation rate of the capital stock.

The firm also faces two external finance constraints:

$$D_{it} \geq D_{it}^{*} \tag{4}$$

$$B_{i,t+1} \leq B_{i,t+1}^{*} \tag{5}$$

where D_{it}^{*} is the lower limit on dividends of the firm, and $B_{i,t+1}^{*}$ is the upper limit on the stock of debt.

The financial frictions are introduced via a constraint on dividends [equation (4)] and a constraint on the external borrowing [equation (5)]. Whited and Wu (2006) point out that it is difficult to separate the identification of the Lagrange multipliers on the dividends constraint and on the debt constraint. Therefore, we follow the approach of Whited and Wu (2006) to focus on the identification of the Lagrange multiplier on the dividends constraint, which is denoted as λ_{it}. This multiplier is equal to the shadow cost associated with raising new equity, which implies that external equity financing is costly. Hence, a higher value of λ_{it} indicates a higher cost of external financing. If the external equity financing constraint is not binding, then the shadow cost of external finance is zero, $\lambda_{it} = 0$.

The Euler equation is obtained from the first-order condition with respect to investment expenditure:

$$E_{it}\beta_t \ddot{E}_{i.t+1}\left[\left(\frac{\partial \pi}{\partial K_{i,t+1}} - \frac{\partial C}{\partial K_{i,t+1}}\right) + (1-\delta_i)\left(\frac{\partial C}{\partial I_{i,t+1}} + 1\right)\right] = \frac{\partial C}{\partial I_{it}} + 1 \qquad (6)$$

where $\frac{\partial C}{\partial I_{it}}$ is the marginal adjustment cost of investment, $\frac{\partial \pi}{\partial K_{i,t+1}} - \frac{\partial C}{\partial K_{i,t+1}}$ is the marginal "net profit" of capital (MPK), and $\ddot{E}_{i.t+1} = \frac{1+\ddot{e}_{i.t+1}}{1+\ddot{e}_{it}}$ is the relative shadow cost of external finance.

The Euler equation (6) indicates that the marginal adjustment and purchasing costs of investing today (on the right-hand side) should be equal to the discounted marginal cost of postponing investment tomorrow (on the left-hand side). The latter is equal to the sum of the foregone marginal net profit of capital stock (given by MPK), plus the adjustment cost and the price of investment tomorrow. In other words, the optimal investment decision of a firm should be made such that, on the margin, it must be indifferent between investing today and transferring those resources to tomorrow.

In the absence of a financing constraint, the shadow cost of external finance is zero, λ_{it}=0. This implies that $\ddot{E}_{i.t+1} = \frac{1+\lambda_{i.t+1}}{1+\lambda_{it}} = 1$. However, if the equity finance is binding, then $\Lambda_{i,t+1} \neq 1$.

To estimate the Euler equation (6), Whited and Wu (2006) made the following simplifying assumptions.

The marginal restricted profit of capital is given by:

$$\frac{\partial \pi}{\partial K_{it}} = \frac{Y_{it} - \mu C_{it}}{K_{it}} \qquad (7)$$

where Y_{it} is output, C_{it} is variable costs, and μ is a constant mark-up.

The real adjustment cost of investment is defined as:

$$C(I_{it}, K_{it}) = \left[\alpha_0 + \sum_{m=2}^{3} \frac{\alpha_m}{m}\left(\frac{I_{it}}{K_{it}}\right)^m\right]K_{it} \qquad (8)$$

where α_m (m=2,3) are parameters to be estimated.

Finally, the unobservable shadow cost of external finance λ_{it} is specified by the Whited-Wu index as follows:

$$\lambda_{it} = b_0 + b_1 ISG_{it} + b_2 SG_{it} + b_3 LNTA_{it} + b_4 CF_{it} + b_5 IDAR_{it} + b_6 TLTD_{it} + b_7 CASH_{it} \quad (9)$$

where b_i is a parameter to be estimated, ISG is the firm's 3-digit industry sales growth; SG is firm sales growth; LNTA is the natural log of total assets; CF is the ratio of cash flow to total assets; IDAR is the firm's 3-digit industry debt-to-assets ratio; TLTD is the ratio of the long-term debt to total assets; and CASH is the ratio of liquid assets to total assets.

Harrison et al. (2003, 2004) also include FDI as an explanatory variable in equation (9). They substitute equations (7), (8), and (9) into Euler equation (6) to derive a linear reduced-form equation for empirical estimation. Hence they can only test whether FDI affects the firms' financing constraint, but they cannot estimate the financing constraint index *per se*.

We follow Whited and Wu (2006) to estimate the nonlinear structural Euler equation by substituting equations (7), (8), and (9) into Euler equation (6) and replacing the expectations operator with an uncorrelated expectational error, $\varepsilon_{i,t+1}$. This gives us the transformed equation (6) as:

$$\beta_t\left(\frac{1+\lambda_{i.t+1}}{1+\lambda_{it}}\right)\left\{\left[\frac{Y_{i.t+1} - \mu C_{i.t+1}}{K_{i.t+1}} - \alpha_0 + \sum_{m=2}^{3}\frac{(m-1)\alpha_m}{m}\left(\frac{I_{i.t+1}}{K_{i.t+1}}\right)^m\right] + (1-\delta_i)\left[\sum_{m=2}^{3}\alpha_m\left(\frac{I_{i.t+1}}{K_{i.t+1}}\right)^{m-1} + 1\right]\right\}$$
$$= \sum_{m=2}^{3}\alpha_m\left(\frac{I_{it}}{K_{it}}\right)^{m-1} + 1 + \varepsilon_{i,t+1} \qquad (10)$$

We apply the GMM estimator to equation (10) in its first differences to eliminate the fixed firm effects. Because of the richness of our dataset, we are able to instrument all of the variables required by the Euler equation (10), as well as inventories, depreciation, current assets, current liabilities, the net value of capital stock, and tax payments. All of these instrumental variables are normalized by total assets. We also include a dummy if the net profit was positive in time *t*-1. All of the instrumental variables are lagged two periods in the GMM estimation.

Similar to Whited and Wu (2006), two constraints are imposed on our GMM estimation. First, we impose the weak unconditional moment restriction that the expected value of the stochastic discount factor β_t is equal to $1/(1+r_{f,t})$, where $r_{f,t}$ is the risk-free rate and is approximated by the official real interest rates of 5-year deposits.[8] Second, we impose a nonnegative constraint on the shadow cost of finance $E(\lambda_{it}) \geq 0$ in the GMM estimation.

Table 2 presents the results of the GMM estimation of the Euler equation (10). Column (1) is the general specification of the model, which includes all seven explanatory variables of the Whited-Wu financing constraint index in equation (9). The *J*-test of over-identification restrictions does not reject this model at the 5 percent significance level. All of the parameters of the Euler equation are significant at the 5 percent level, except the ratio of liquid assets to total assets (*CASH*) in the Whited-Wu index. However, if we exclude all of the explanatory variables in equation (9) of the Whited-Wu index [see the GMM estimation results in column (4)], the *J*-test significantly rejects this specification at the 5 percent level. This implies that the traditional Euler equation without a financing constraint is an inappropriate model for our dataset. Indeed, the *L*-test for the exclusion restrictions of all these explanatory variables in the Whited-Wu index also rejects the null hypothesis that the parameters of these variables are jointly equal to zero at the 5 percent significance level.

[8] We use the nominal interest rates on enterprise deposits (5-year) minus inflation as a proxy. Source: Table 20-10 and Table 9-1, *China Statistical Yearbook* (2006).

Column (2) of Table 2 presents the GMM estimation results after deleting the insignificant variable *CASH* from column (1). Neither the *J*-test of over-identification restrictions and the *L*-test of exclusion restrictions reject this model at the 5 percent significance level. If we delete one more variable (*TLTD*) that has the smallest *t*-value from column (2), the model is then rejected by both the *J*-test and the *L*-test at the 5 percent significance level [see column (3)].

Hence column (2) is our preferred specification for both the Euler equation and the Whited-Wu index equation. Note that all of the explanatory variables of the Whited-Wu index in column (2) have the expected signs, which is consistent with the theoretical predictions. For instance, the negative sign on the log of total assets (*LNTA*) captures the well-documented size effect (see, for example, Beck, Demirguc-Kunt, and Maksimovic, 2005): small firms are more likely to have financing constraints than large firms. The negative coefficient on the cash flow to assets ratio shows that financially healthier firms with a high cash flow are less likely to be constrained. The positive sign on the industry sales growth (*ISG*) and negative sign on the firm sales growth (*SG*) indicate that only firms with good investment opportunities in high-growth industries are likely to make large investments and still be constrained. The positive parameter on the firm-level debt to assets ratios (*TLTD*) and the negative parameter on the industry-level debt-to-assets ratios (*IDAR*) reveal that financially constrained firms are likely to have high debt but reside in low-debt capacity industries. Finally, the mark-up (μ) and adjustment-cost coefficient (α_2) are both positive and significantly different from zero.

Our estimated Whited-Wu financing constraint index can be constructed from the Euler equation in column (2) of Table 1:

$$\hat{\lambda}_{it} = 1.421 + 0.066 ISG_{it} - 0.012 SG_{it} - 0.046 LNTA_{it} - 0.031 CF_{it} - 0.149 IDAR_{it} + 0.042 TLTD_{it} \quad (11)$$

5. Testing for the Political Pecking Order Hypothesis

As a formal exploration of how financing constraints differ across firm ownerships and across regions, we apply OLS estimations to the following equation. We estimate equation (12) separately for each year, using state-owned firms and interior firms as the reference groups:

$$WW\ index = \theta_0 + \theta_1\, private + \theta_2\, collective + \theta_3\, foreign + \theta_4\, coast + e, \qquad (12)$$

where

WW index = Whited-Wu financing constraint index;
private = dummy variable equal to 1 if the firm is privately owned;
collective = dummy variable equal to 1 if the firm is collectively owned;
foreign = dummy variable equal to 1 if the firm is foreign-owned;
coast = dummy variable equal to 1 if the firm is coastal.

Table 3 presents the summary results of the estimated θ_i from these regressions. Throughout this paper, the p-values are presented in brackets and are computed by robust standard errors clustered for province and year. Table 3 confirms the political pecking order of the firm's financing constraints: the state-owned enterprises have less financing constraints than the collective-owned firms, and the latter in turn are less constrained than the private firms. The table also shows that the foreign firms actually enjoy the least financing constraints among all firms in the garment industry in China. Another finding is that firms located in the coastal areas are less constrained than those located in the interior areas. Such patterns are quite persistent over our sample period from 2001 to 2005. All of these findings are the most systematic demonstration of many of the stylizations informally postulated by economists and they thus increase our confidence in the Euler equation approach.

6. Testing for the Fire-Sale Hypothesis

One substantial advantage of our dataset is that it spans multiple years (2001-2005). We can thus observe the timing of the formation of joint ventures. On the basis of the information in the firm ID (and other variables), we know the registration status of a firm in year *t-1* and its registration status in year *t*. This before-and-after feature of the dataset is critical as it allows us to control for those dynamics antecedent to the formation of the joint venture. We are able to make inferences about motivations in a way that the previous research—based on cross-sectional data—could not. For example, Guariglia and Poncet (2008), although showing relationships between financing constraints and FDI that are directionally similar to those in our paper, cannot distinguish between FDI as the effect and FDI as the cause of the financial alleviations. In this paper, all the independent variables precede the dependent variable by one year.

To study the decision making of private firms to form joint ventures with HMT firms, we estimate a probit model in which the dependent variable is an indicator with 1 being a new joint venture at time *t* and 0 otherwise. The specification of the probit model is as follows:

$$Z_{it} = F(WW\ index_{i,t-1},\ WWindex_{i,t-1}*lnTFP_{i,t-1},\ export\ share_{i,t-1},\ regional\ income_{i,t-1},\ lawyer\ \ density_{i,t-1},\ lnTFP_{i,t-1},\ age_{it-1},\ size_{i,t-1},\ K/L_{i,t-1},\ R\&D_{i,t-1},\ coast_{i,t-1},\ year) + e_{it} \quad (13)$$

where:

Z_i = 0-1 indicator variable with 1 being a new joint venture with HMT firms, and 0 otherwise;

WW index = Whited-Wu financing constraint index;

export share = share of exports in the firm's total sales;

regional income = log of provincial GDP per capita;

lawyer density = number of layers per 100,000 persons;

lnTFP = log of total factor productivity;

age = firm age;

size = firm size measured by total sales;

K/L = capital-labor ratio;
R&D = R&D expenditure;
coast = dummy variable for coastal provinces;
year = a full set of year dummies;

Since HMT firms generally have more experience and better distribution channels in the export market, Chinese firms may seek HMT partners to boost their exports. In equation (13), we include export share as an independent variable to control for such a firm-specific advantage of HMT firms. To the extent that foreign firms often pick the best domestic firms as their targets for joint ventures, we include lnTFP and R&D to control for the cream-skimming effect (Razin and Sadka, 2007). Previous studies find that local income and rule of law are important factors that affect foreign investment in China (Fung, Iizaka, and Parker, 2002; Wei, 2000). We use provincial regional income and lawyer density to control for the local investment environment.

Table 4 reports the estimation results of equation (13). The coefficient estimates are transformed to marginal effects evaluated at the means of the independent variables from the probit regressions. In the first column, the coefficient of the WW index has a positive sign and is statistically significant. The second column includes an interaction term with a positive sign, indicating the strong interacting effect of high TFP and tight financing constraints (i.e., a high value of the WW index) inducing domestic private firms to source foreign equity capital. While financing constraints increase the odds of forming joint ventures across the board, they do so especially vis-à-vis the most productive private firms.

One potential disadvantage of equation (13) is that the WW index might be endogeneous even if it is one year preceding the dependent variable of the joint-venture decision. The financial situation of the past year might be affected by the anticipation of forming a joint venture in the current year. We devised two ways to check the robustness of our results. First, we replaced the WW index by the average WW index in the past 3 years under Column (3). This is meant to capture the steady-state financing treatments of Chinese

private firms. The result is consistent with what we obtained earlier. The positively significant 3-year average WW index demonstrates that a persistently tight financing constraint for Chinese private firms makes them more receptive to injections of foreign funds.

Our second method is to replace the WW index with an alternative regional financing constraint measure (calculated as the non-bank loan ratio on the basis of the 2000 private-sector survey). Unlike the WW index, the regional financing constraint measure is not specific to the firms in the NBS dataset. (The measure is derived from a different source of data altogether.) The endogeneity problem here is probably very small. Columns (4) and (5) of Table 4 report the results with our alternative measure of the regional financing constraint—regional non-bank loan share in total debt. We find that firms located in those regions with a lower non-bank loan share cede their equity to foreign firms more often. Our two measures of financing constraints produce directionally-similar coefficients. In general, Table 4 supports strongly the hypothesis that private firms with greater financing constraints are more likely to look for foreign investment.

Our estimates are not only statistically significant but also economically meaningful. Let us compare the firms in the top 25 percent of the most financing constraints with an average firm in Zhejiang province. Zhejiang is widely known in China for its pro-entrepreneurial and pro-private-sector policies. Not surprisingly, it has the lowest WW index among all provinces in China. According to Column (2) in Table 4, we calculate the predicted probability of joint venture, Z_i, when all variables are evaluated at their mean values of those firms with the top 25 percent of the most financing constraints. Then we replace the WW index with the mean value of Zhejiang firms and calculate another predicted probability. The difference of the two predicted probabilities is 11.5 percentage points, which implies that, controlling for all the normal economic and business motivations to form a joint venture, those most constrained private firms would have been 11.5 percent less likely to share equity with foreign investors if they had faced the same financing constraints as those firms located in Zhejiang.

Generally consistent with existing theories, in Table 4 we also find that private garment firms with higher TFP, larger exports, larger sales, lower age, lower capital intensity, located in the coastal region, and located in a province with a larger lawyer density and higher income, are more likely to form joint ventures with HMT firms. However, in all specifications, R&D expenditure does not appear statistically significant, which supports our argument that technology does not play a decisive role in the joint-venture decisions of private garment firms.

An alternative specification of equation (13) is to define the dependent variable as foreign equity share, a continuous variable. Since foreign equity share is bounded between 0 and 1, we estimate a tobit model with the same independent variables as in Table 4. The results reported in Table 5 are qualitatively consistent with those in Table 4. Again, we can compare the firms in the top 25 percent of the most financing constraints with a typical firm in Zhejiang province. Using the estimates in Column (2), the difference in the predicted foreign equity share is 31.5 percentage points. In other words, the firms in the top 25 percent of the most financing constraints could have avoided losing 31.5 percent of the equity share to foreign firms if they had faced the same financing constraint as Zhejiang firms. Since all the theoretically-relevant economic and business factors are already controlled for, the 31.5 percent difference is a concrete illustration of the fire-sale dynamics (minus the actual fire of the financial crisis).

Economists in general recognize the value of corporate control. Our next analysis is to ascertain whether the financing constraints were severe enough not only to induce Chinese private entrepreneurs to substitute equity financing for credit financing but to do so to the extent of losing control of their firms. We use an ordered probit model to examine the effect of financing constraints on the transfer of control rights to foreign firms and we devise a number of ways to denote “control” and its transfer.

According to the official Chinese definition, the criterion for foreign-invested firms is that the foreign equity share should be no less than 25 percent. Since we have detailed information on the equity structure of each firm, we define the dependent variable of

foreign control as follows: 0 for no foreign share, 1 for foreign share above 0 but less than 25 percent, 2 for foreign share above 25 percent but no more than 50 percent, and 3 for foreign share above 50 percent. We report the estimation results of the ordered probit model in Table 6. We use the WW index in the first four columns and the non-bank loan share in the last four columns as our measure of the financing constraint. The financing constraint variables are positive and significant in both specifications, suggesting that firms that are more financially constrained may have to relinquish more control rights to foreign partners.

As a robustness check, we redefine foreign control in the following way: 0 for no foreign share, 1 for relative minority share, and 2 for relative majority share. The results in Table 7 are consistent with those in Table 6. A higher financing constraint is associated with a higher probability of joint ventures in which the foreign investors hold a majority share.

To further check the sensitivity of our definition of foreign control, we define the dependent variable in terms of the change in the legal person representative. In our dataset, each firm reports the name of the "legal person representative." According to Chinese Corporation Law, firms are required to register the name of the legal person representative, who is usually the president or chairman of the board of directors. We believe when a new joint venture registers a different legal person representative, it is very likely that the private entrepreneurs have lost control of the firm. Thus, we define foreign control as follows: 0 for no foreign share, 1 for positive foreign share but no change in the legal person representative, and 2 for positive foreign share and a change in the legal person representative. The results reported in Table 8 are quite similar to those we find in Table 6 and 7. Private entrepreneurs with greater financing constraints are more likely to lose their legal-person representation and presumably lose the control of their firms to their foreign partners.

7. Conclusions

In this paper, we test two related hypotheses that go some way to explain the otherwise puzzling phenomenon of abundant FDI in a sector devoid of normal drivers of FDI (such as technology). We first show the existence of a political pecking order of firms in China that is prejudiced against private-sector firms. We then show that this political pecking order of firms—in the form of financing constraints on private-sector firms—may have induced labor-intensive FDI. We use a large firm-level panel dataset from the Chinese National Bureau of Statistics, supplemented by a comprehensive survey of private enterprises in 2000. Our findings support both hypotheses. We follow Whited and Wu (2006) to estimate the investment Euler equation and to construct a financing constraint index for each firm. We show that the financing constraint index is higher for private and collective firms and lower for foreign and state-owned firms. Our estimation of the probit model suggests that firms with greater financing constraints are more likely to be acquired and controlled by foreign firms.

Do our findings suggest a "fire-sale" scenario? The limitation of our dataset is that we cannot directly observe the equity prices of the foreign capital injections. To approximate the discount of the equity price postulated in a fire-sale scenario we use the percent share of the Chinese entrepreneurs' shareholder equity as a proxy. We find that those firms in the top 25 percent of the most financing constraints could have avoided losing 31.5 percent of the equity share to foreigners had they faced the same favorable financing constraints as a typical Zhejiang firm. This is evidence that an inefficient political pecking order entails some real welfare implications as it reduces the claims of Chinese private entrepreneurs on future profits.

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Table 1. Summary Statistics of Private Garment Firms

	Mean	Sd	min	max
New joint venture with HMT firms	0.26	0.44	0.00	1.00
WW index	0.95	0.05	0.64	1.67
Non-bank loan share	0.37	0.21	0.00	1.00
ln TFP	6.09	0.80	1.24	10.02
Export share	0.46	0.53	0.00	1.00
ln sales	9.58	0.86	2.08	13.87
ln age	1.64	0.74	0.00	3.95
K/L ratio	18.15	32.15	0.39	1222.20
R&D	0.23	1.01	0.00	10.35
Provincial lawyer density	0.03	0.02	0.00	0.09
ln provincial GDP per capita	9.22	0.59	7.97	10.92
No. of firms	11,402			
Sample period	2001-2005			

Notes: The new joint-venture variable is a 0-1 indicator with 1 being a new joint venture with a Hong Kong, Macao, and Taiwan firm, and 0 otherwise. The WW index is the Whited and Wu (2006) financing constraint index. A higher value of the index indicates a higher external finance cost. Non-bank loan share is the ratio of non-bank loans to total debt at the regional level. A higher value of the ratio indicates more difficulty to raise funds by private firms in the region. lnTFP is the logarithm of total factor productivity calculated with the Levinsohn and Petrin (2003) semi-parametric procedure.

Table 2. Euler Equation Estimates

	1	2	3	4
α_0	1.219	1.218	1.243	1.509
	[0.002]***	[0.002]***	[0.001]***	[0.001]***
α_2	0.188	0.188	0.190	0.204
	[0.035]**	[0.037]**	[0.047]**	[0.034]**
α_3	-0.214	-0.215	-0.217	-0.224
	[0.046]**	[0.047]**	[0.045]**	[0.038]**
μ	1.035	1.035	1.033	1.009
	[0.000]***	[0.000]***	[0.000]***	[0.000]***
b_0	1.433	1.421	1.414	
	[0.045]**	[0.040]**	[0.043]**	
ISG	0.063	0.066	0.063	
	[0.018]**	[0.015]**	[0.013]**	
SG	-0.012	-0.012	-0.012	
	[0.021]**	[0.022]**	[0.027]**	
LNTA	-0.046	-0.046	-0.043	
	[0.000]***	[0.000]***	[0.000]***	
CF	-0.031	-0.031	-0.034	
	[0.031]**	[0.031]**	[0.033]**	
IDAR	-0.149	-0.149	-0.149	
	[0.000]***	[0.000]***	[0.000]***	
TLTD	0.048	0.042		
	[0.041]**	[0.043]**		
CASH	-0.012			
	[0.2533]			
Observations	7515	7515	7515	7515
pv of J-test	0.261	0.223	0.041	0.002
pv of L-test	na	0.181	0.003	0.001

Notes: The unbalanced panel sample consists of garment industry firms over the period from 2001 to 2005. The Euler equation is given by equation (10) of Whited and Wu (2006). The nonlinear GMM estimation is carried out with the model in first differences with twice lagged instruments. α_i is the investment adjustment cost parameter, and μ is a mark-up. ISG is the firm's 3-digit industry sales growth; SG is the firm sales growth; LNTA is the natural log of total assets; CF is the ratio of cash flow to total assets; IDAR is the firm's 3-digit industry debt-to-assets ratio; TLTD is the ratio of the long-term debt to total assets; and CASH is the ratio of liquid assets to total assets. P-values are reported in brackets. The p-values of the J-test and L-test on the model specification are reported in the last two rows.

Table 3. Political Pecking Order of Financing Constraints

	Yr2001	Yr2002	Yr2003	Yr2004	Yr2005	All
Private	0.0226	0.0237	0.0206	0.0152	0.0229	0.0220
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***
Collective	0.0125	0.0180	0.0137	0.0109	0.0173	0.0129
	[0.001]***	[0.000]***	[0.002]***	[0.000]***	[0.000]***	[0.001]***
Foreign	-0.0025	-0.0022	-0.0031	-0.0043	-0.0058	-0.0029
	[0.031]**	[0.028]**	[0.028]**	[0.039]**	[0.045]**	[0.048]**
Coast	-0.0035	-0.0034	-0.0023	-0.0029	-0.0020	-0.0031
	[0.017]**	[0.023]**	[0.045]**	[0.027]**	[0.039]**	[0.046]**
Observations	2,122	2,938	3,303	3,219	5,236	16,818

Notes: The dependent variable is the estimated Whited-Wu financing constraint index. A higher value of the index indicates a higher external finance cost. A constant is included in the regression but not reported. P-values are presented in brackets and are computed by robust standard errors clustered for provinces and ownerships. *, **, *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Table 4. Probit Estimation of Self-Selection of Private Firms to Form Joint Ventures

	1	2	3	4	5
WW index	0.0925 [0.017]**	0.1115 [0.005]***			
WW index × ln TFP		0.0237 [0.029]**			
Three-Year WW index			0.1043 [0.008]***		
Three-year WW index × ln TFP			0.0188 [0.039]**		
Non-bank loan share				0.0565 [0.034]**	0.0593 [0.017]**
Non-bank loan share × ln TFP					0.0182 [0.040]**
ln TFP	0.0018 [0.032]**	0.0021 [0.030]**	0.0034 [0.037]**	0.0016 [0.036]**	0.0009 [0.038]**
Export share	0.0043 [0.021]**	0.0055 [0.011]**	0.0043 [0.041]**	0.0062 [0.000]***	0.0067 [0.000]***
Firm size	0.0030 [0.025]**	0.0022 [0.031]**	0.0018 [0.036]**	0.0063 [0.001]***	0.0059 [0.002]***
Firm age	-0.0028 [0.064]*	-0.0025 [0.087]*	-0.0026 [0.075]*	-0.0027 [0.093]*	-0.0025 [0.090]*
K/L	-0.00001 [0.031]**	-0.00001 [0.033]**	-0.00002 [0.012]**	-0.00002 [0.036]**	-0.00001 [0.028]**
R&D	-0.00003 [0.129]	-0.00006 [0.120]	-0.00004 [0.122]	-0.00003 [0.110]	-0.00004 [0.161]
Coast dummy	0.0117 [0.031]**	0.0113 [0.022]**	0.0117 [0.019]**	0.0097 [0.033]**	0.0094 [0.043]**
Provincial lawyer density	0.0023 [0.016]**	0.0029 [0.020]**	0.0024 [0.019]**	0.0042 [0.000]***	0.0045 [0.009]***
Regional income	0.0052 [0.011]**	0.0056 [0.012]**	0.0053 [0.011]**	0.0042 [0.006]***	0.0046 [0.007]***
Year dummies	yes	yes	yes	yes	yes
Observations	11402	11402	11402	8162	8162
Pseudo_ R^2	0.148	0.152	0.149	0.174	0.175
Log_likelihood	-1006.65	-1115.2	-1005.07	-687.826	-764.4

Notes: See Table 1. The dependent variable is the 0-1 indicator, with 1 a new joint venture with Hong Kong, Macao, or Taiwan ownership in the garment industry, and 0 for the remaining purely domestic private firms without any foreign equity. Column (3) is the average WW index for the last three years. The coefficient estimates are transformed to represent the marginal effects evaluated at the means of the independent variables from the probit regressions. P-values are presented in brackets and are computed by robust standard errors clustered for provinces and years. *, **, *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Table 5. Tobit Estimation of Equity Share of HMT Joint Ventures

	1	2	3
WW index	0.6899 [0.039]**	0.5531 [0.038]**	0.5674 [0.022]**
WW index × ln TFP		0.0268 [0.006]***	0.0219 [0.003]***
ln TFP	0.0984 [0.032]**	0.0790 [0.035]**	0.0734 [0.033]**
Export share	0.0604 [0.003]***	0.0609 [0.008]***	0.0608 [0.001]***
Firm size	0.0839 [0.031]**	0.0744 [0.026]**	0.0941 [0.038]**
Firm age	-0.0301 [0.012]**	-0.0304 [0.011]**	-0.0273 [0.027]**
K/L	-0.0005 [0.015]**	-0.0006 [0.037]**	-0.0004 [0.034]**
R&D	-0.0003 [0.168]	-0.0006 [0.159]	-0.0005 [0.145]
Coast dummy	0.0570 [0.044]**	0.0533 [0.037]**	0.0492 [0.034]**
Provincial lawyer density	0.0520 [0.000]***	0.0522 [0.000]***	0.0526 [0.000]***
ln regional GDP per capita	0.0976 [0.023]**	0.0967 [0.016]**	0.0989 [0.015]**
Constant	0.6279 [0.032]**	0.4809 [0.041]**	0.5035 [0.019]**
Year dummies	yes	yes	yes
Observations	11402	11402	11402
Pseudo_R2	0.178	0.176	0.171
Log_likelihood	-1684.413	-1683.959	-1680.89

Notes: The dependent variable is the equity shares of HMT investors. It takes the value of zero for purely domestic private firms without any foreign equity. Column (3) is the average WW index in the last three years. The coefficient estimates are transformed to represent the marginal effects evaluated at the means of the independent variables from the probit regressions. P-values are presented in brackets and are computed by robust standard errors clustered for provinces and years. *, **, *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively.

Table 6. Ordered Probit Estimation of Equity Control in the HMT Joint Ventures

	1	2	3	4	5	6	7	8
	Parameter	Marginal Effects (dP/dx)			Parameter	Marginal Effects (dP/dx)		
		(0, 25%)	[25%-50%]	(50%, 1]		(0, 25%)	[25%-50%]	(50%,1]
WW index	2.9392	0.0507	0.1542	0.7407				
	[0.041]**	[0.041]**	[0.036]**	[0.039]**				
WW index × ln TFP	0.5934	0.0102	0.0311	0.1495				
	[0.027]**	[0.028]**	[0.023]**	[0.025]**				
Nonbank loan share					1.8067	0.0357	0.1073	0.4537
					[0.031]**	[0.035]**	[0.022]**	[0.031]**
Nonblank loan share × ln TFP					0.2553	0.0050	0.0152	0.0641
					[0.035]**	[0.037]**	[0.036]**	[0.042]**
ln TFP	0.0552	0.0010	0.0029	0.0139	0.0468	0.00092	0.0028	0.0118
	[0.028]**	[0.031]**	[0.022]**	[0.028]**	[0.029]**	[0.033]**	[0.032]**	[0.035]**
Export share	0.1231	0.0021	0.0065	0.0310	0.1690	0.0033	0.0100	0.0424
	[0.021]**	[0.024]**	[0.033]**	[0.016]**	[0.010]***	[0.013]**	[0.023]**	[0.000]***
Firm size	0.1008	0.0017	0.0053	0.0254	0.1532	0.0030	0.0091	0.0385
	[0.034]**	[0.035]**	[0.031]**	[0.038]**	[0.003]***	[0.014]**	[0.002]***	[0.008]***
Firm age	-0.0129	-0.00022	-0.00068	-0.0033	-0.0125	-0.00025	-0.00074	-0.0031
	[0.066]*	[0.072]*	[0.075]*	[0.073]*	[0.078]*	[0.087]*	[0.093]*	[0.084]*
K/L	-0.0022	-0.000038	-0.00012	-0.0006	-0.0026	-0.000051	-0.00015	-0.00065
	[0.024]**	[0.023]**	[0.021]**	[0.026]**	[0.035]**	[0.035]**	[0.038]**	[0.033]**
R&D	-0.0029	-0.000050	-0.00015	-0.00074	-0.0028	-0.000054	-0.00016	-0.00069
	[0.128]	[0.123]	[0.125]	[0.143]	[0.171]	[0.134]	[0.169]	[0.178]
Coast dummy	0.3831	0.0069	0.0207	0.0713	0.2437	0.0045	0.0133	0.0688
	[0.023]**	[0.012]**	[0.017]**	[0.016]**	[0.035]**	[0.042]**	[0.041]**	[0.045]**
Provincial lawyer density	0.0714	0.0012	0.0037	0.0180	0.1247	0.0025	0.0074	0.0313
	[0.011]**	[0.013]**	[0.016]**	[0.004]***	[0.000]***	[0.005]***	[0.001]***	[0.004]***
Regional income	0.2404	0.0041	0.0126	0.0606	0.1470	0.0029	0.0087	0.0369
	[0.014]**	[0.041]**	[0.025]**	[0.012]**	[0.027]**	[0.036]**	[0.035]**	[0.027]**
Year dummies	yes				yes			
Observations	11402				8162			
Pseudo_ R^2	0.165				0.186			
Log_likelihood	-1308.0				-913.4			

Notes: see table 1. Dependent variable is equity control status of Hong Kong, Macao, and Taiwan (HMT) investors: 0 stands for no foreign share and no foreign control; 1 stands for foreign share above 0 but less than 25%, 2 stands for foreign share above 25% but no more than 50%; 3 stands for foreign share above 50%. *, **, *** denote statistical significance at the 10%, 5% and 1% level respectively.

Table 7. Ordered Probit Estimation of Majority Share in the HMT Joint Ventures

	1	2	3	4	5	6
		Marginal Effects (dP/dx)			Marginal Effects (dP/dx)	
	Parameter	Minority	Majority	Parameter	Minority	Majority
WW index	2.8458	0.0948	0.9153			
	[0.015]**	[0.013]**	[0.025]**			
WW index × ln TFP	0.5883	0.0196	0.1892			
	[0.028]**	[0.028]**	[0.021]**			
Nonbank loan share				1.6594	0.0467	0.5130
				[0.016]**	[0.018]**	[0.015]**
Nonblank loan share × ln TFP				0.2283	0.0064	0.0706
				[0.024]**	[0.032]**	[0.024]**
ln TFP	0.0544	0.0018	0.0175	0.0268	0.00075	0.0083
	[0.030]**	[0.023]**	[0.036]**	[0.031]**	[0.031]**	[0.039]**
Export share	0.1251	0.0042	0.0402	0.1700	0.0048	0.0526
	[0.020]**	[0.038]**	[0.014]***	[0.000]***	[0.005]***	[0.001]***
Firm size	0.1086	0.0036	0.0349	0.1611	0.0045	0.0498
	[0.029]**	[0.033]**	[0.028]**	[0.001]***	[0.000]***	[0.001]***
Firm age	-0.0122	-0.00040	-0.0039	-0.0121	-0.00034	-0.0037
	[0.077]*	[0.074]*	[0.079]*	[0.081]*	[0.088]*	[0.090]*
K/L	-0.0025	-0.000087	-0.00081	-0.0029	-0.000082	-0.00091
	[0.021]**	[0.025]**	[0.034]**	[0.023]**	[0.027]**	[0.022]**
R&D	-0.0031	-0.00010	-0.0012	-0.0024	-0.000066	-0.00073
	[0.111]	[0.109]	[0.133]	[0.164]	[0.143]	[0.175]
Coast dummy	0.3935	0.0131	0.1016	0.2123	0.0053	0.0721
	[0.017]**	[0.009]***	[0.011]**	[0.035]**	[0.042]**	[0.041]**
Provincial lawyer density	0.0713	0.0024	0.0229	0.1226	0.0034	0.0379
	[0.034]**	[0.041]**	[0.021]**	[0.032]**	[0.007]***	[0.032]**
Regional income	0.2445	0.0081	0.0786	0.1544	0.0043	0.0477
	[0.012]**	[0.028]**	[0.037]**	[0.034]**	[0.044]**	[0.034]**
Year dummies	yes			yes		
Observations	11402			8162		
Pseudo_ R^2	0.168			0.190		
Log_likelihood	-1234.0			-860.7		

Notes: see table 1. Dependent variable is equity control status of Hong Kong, Macao, and Taiwan (HMT) investors: 0 stands for no foreign share and no foreign control; 1 stands for foreign investor has minority equity control; 2 stands for foreign investor has majority equity control.

Table 8. Ordered Probit Estimation of Legal Person Representative Change in the HMT Joint Ventures

	1	2	3	4	5	6
		Marginal Effects (dP/dx)			Marginal Effects (dP/dx)	
		Legal Person Representative			Legal Person Representative	
	Parameter	Unchanged	Changed	Parameter	Unchanged	Changed
WW index	3.2426 [0.038]**	0.2996 [0.041]**	0.9648 [0.032]**			
WW index × ln TFP	0.6443 [0.025]**	0.0595 [0.033]**	0.1917 [0.026]**			
nonbank loan share				1.9160 [0.012]**	0.1731 [0.021]**	0.5597 [0.012]**
Nonblank loan share × ln TFP				0.2711 [0.018]**	0.0245 [0.029]**	0.0792 [0.018]**
ln TFP	0.0593 [0.027]**	0.0055 [0.037]**	0.0176 [0.022]**	0.0436 [0.032]**	0.0039 [0.035]**	0.0127 [0.037]**
Export share	0.1308 [0.014]**	0.0121 [0.047]**	0.0389 [0.007]***	0.1743 [0.000]***	0.0158 [0.005]***	0.0509 [0.001]***
Firm size	0.1150 [0.029]**	0.0106 [0.023]**	0.0342 [0.034]**	0.1672 [0.001]***	0.0151 [0.014]**	0.0488 [0.007]***
Firm age	-0.01512 [0.075]*	-0.0014 [0.084]*	-0.0045 [0.089]*	-0.0114 [0.062]*	-0.0011 [0.082]*	-0.0033 [0.078]*
K/L	-0.0033 [0.019]**	-0.00030 [0.023]**	-0.0011 [0.035]**	-0.0011 [0.025]**	-0.00010 [0.036]**	-0.00032 [0.035]**
R&D	-0.0028 [0.111]	-0.00026 [0.163]	-0.00083 [0.125]	-0.0022 [0.159]	-0.00021 [0.139]	-0.00064 [0.161]
Coast dummy	0.3864 [0.017]**	0.0279 [0.011]**	0.1015 [0.009]***	0.2004 [0.036]**	0.0204 [0.042]**	0.0597 [0.041]**
Provincial lawyer density	0.0709 [0.029]**	0.0066 [0.029]**	0.0211 [0.021]**	0.1176 [0.000]***	0.0106 [0.001]***	0.0344 [0.008]***
Regional income	0.2392 [0.011]**	0.0221 [0.042]**	0.0712 [0.035]**	0.1583 [0.028]**	0.0143 [0.044]**	0.0462 [0.037]**
Year dummies	yes			yes		
Observations	11402			8162		
Pseudo_ R^2	0.170			0.191		
Log_likelihood	-1234.0			-845.3		

Notes: see table 1. Dependent variable is an indicator of change of legal person in HMT joint-ventures: 0 stands for no foreign investment; 1 stands for the legal person remained unchanged after the joint venture with Hong Kong, Macao, and Taiwan (HMT) investors was formed; 2 stands for a change of legal person after the joint venture was formed.