Foreign Direct Investment, Financial constraints and growth in China*

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Abstract

In this paper we use a unique micro-level data-set of Chinese firms to test for the impact of financial constraints faced by private Chinese firms. Our results clearly show that private Chinese firms are credit constrained, whereas Foreign Invested Enterprises (FIEs) and State-Owned Chinese firms (SOEs) do not face such constraints. The empirical evidence presented in this paper seems to confirm the "political pecking order" theory developed by Huang [2004] who argues that the "Chinese growth miracle" is predominantly a side-effect of existing capital market distortions in China. According to this theory, the large influx of Foreign Direct Investment (FDI) into China was triggered by a lack of credit of domestic private Chinese firms that were consequently forced to "sell out" to foreign firms in order to grow further. This paper is the first to provide empirical evidence of firm level financial constraints faced by Chinese firms.

Keywords: Investment-cashflow sensitivity, China, firm level data, foreign direct investment

JEL Classifications: E22; G32

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1 Introduction

In this paper we want to test the central hypothesis put forward by Huang (2004). In his book "Selling China", Huang (2004) argues that China has long been characterized by a "political pecking order" for credit. Until recently, domestic credit was almost exclusively reserved for Chinese state owned firms. By law, the largest Chinese banks were until 1998 instructed not to lend to private firms. This was embedded in a deep political notion that private firms do not rank high in terms of political status. Huang (2004) argues that while in principle the "political pecking order" should have been alleviated substantially ever since 1998, it has persisted because it is rooted in deep social and political factors.

Despite programs of privatizations especially of State Owned Enterprises (SOEs) and other institutional/legal changes, culturally there is still a resistance against lending to private firms that follows from "an ideological hostility toward private firms", Huang (2004). This corresponds with what has been pointed out by others that in China the rule of law is often subordinate to a set of social values and beliefs related to Confucius in which "trust" plays a significant role. Most privatization schemes were not full privatizations but rather share issuing privatizations (SIPs). In most cases the state kept a substantial portion of the shares but offered only part of the common stock to the public. Incidentally, these partly privatized state owned firms constitute 93% of all publicly listed firms in China (Quan and Huyghebaert (2005)). This suggests that the Chinese government while ready to widen the ownership of SOEs is not changing the nature of the ownership.

The small amount of credit going to private firms according to currently constitutes the largest inhibition for growth of private firms in China, Huang (2004). This misalignment of credit can have multiple implications in terms of efficiency and growth, Aghion, Angeletos, Banerjee, and Manova (2005). Up to this moment data limitations only allowed for anecdotal studies or survey evidence, Allen, Qian, and Qian (2005). However in this paper we have access to relatively good quality firm level data on China for five consecutive years 2001 until 2005. This will allow us to more formally test models of investment-cash flow sensitivity, which will enables us to verify previous assertions on the limited access to funds for private Chinese firms (Huang (2004), Allen, Qian, and Qian (2005)).

To date, four of the five largest banks in China are still in state hands, Cheng and Degryse (2005). The banking sector is still the main source of financing for firms since stock markets have only recently started to develop, Allen, Qian, and Qian (2005). Recent studies have shown that the relationship between bank loans and local output growth at the province level is stronger that the relationship between non-bank loans and growth.

Li and Liu (2001) indirectly suggest that private Chinese firms, which predominantly have to rely on the non-bank sector like local credit cooperatives, have less opportunities to grow.

Loans by these state banks are often made to SOEs on the basis of political considerations rather than economic considerations, resulting to a large extent in "bad loans". By now it is clear that the efficiency of private firms is higher than the efficiency of state firms (Dollar and Wei (2007)). In general, the discrimination of banks against private firms in granting access to loans is particular severe in industries where the concentration of State Owned Enterprises is high, **?**. Contrary if private firms do not compete directly with State Owned firms access to credit is credited more easily. Moreover, local authorities in China tend to favor incumbent firms to the detriment of firms from other jurisdictions. Hence, the political pecking order is not adopted uniformly across industries and the country. For example provinces like Guangdong, Shangong and Zhejiang that lie in the South-east are more economically flexible. While other local governments discriminate against private firms from outside the region, even going as far as to forbid bank lending to the outside firms. Examples of regions where the political pecking order is supposed to be more strictly enforced are Beijing, Shanxi and Ningxia. According to a number of authors, for example Keister and Lu (2001), these led to a large Economic fragmentation in China resulting in regional and industry heterogeneity.

Chinese firms who received Foreign Direct Investment (FDI) may suffer less from this political pecking order. According to Huang (2004), one of the main driving forces behind the massive inflow of FDI in China, is that foreign firms could see the local business opportunities that could not be seized by domestic private firms due to lack of financing. As several studies by now have confirmed using firm level data, the large state owned firms on the other hand, while ample access to credit, prove to be much less efficient as the domestic private firms . Foreign firms are less dependent on the local capital markets since they belong, totally or partly, to a multinational group typically with their parent firm outside China resulting in easier access to equity and bank financing. Also, with the recent entry of China in 2001 in the WTO, more and more foreign banks are starting to enter the economy.

We evaluate the magnitude of financing constraints by introducing external financing costs in the investment Euler equation. This provides a theoretical justification for our measure of financing constraints. We interpret the sensitivity of investment to the availability of internal funds (measured by the stock of liquid assets) as a proxy for the degree of financing constraints.

One way to check for credit constraints is the investment-cash flow model as in Fazzari,

Hubbard, and Petersen (1988a). An alternative model is Carpenter and Petersen (2002). In this paper we will use the Euler model of to motivate our estimation equation and test whether we find any empirical evidence suggesting that indeed private Chinese firms are substantially more credit constrained than state firms and foreign firms. First, we test whether foreign capital inflows are associated with a reduction in financing constraints for private firms and secondly we test whether financing constraints are different among regions and industries.

Our results confirm the existence of a "political pecking order" for credit in China. Using a firm level data set while taking advantage of cross province, industry and ownership variation, we show that private firms face severe financial constraints constraints in China and that private firms having access to foreign capital via FDI do not face such constraints. Contrary to private firms, State Owned firms are benefiting from this political pecking order by having access to credit. By distinguishing between different types of FDI, we find evidence that having access to international capital markets results in not being financially constrained in China. We also industry and provincial heterogeneity and find that financial constraints are particular high in industries, where the concentration of State Owned Enterprises is dense and in the provinces lying in the north and east of China. Given these result, we conclude that FDI eases financial constraints and State Owned enterprises are subject to a soft budget constraint. We add to existing literature of financing constraints in transition economies (Konings, Rizov, and Vandenbussche (2003) and Lizal and Svejnar (2002)).

The remainder of this paper is organized as follows. Section 2 provides a theoretical justification for our measure of financing constraints. Section 3 describes the data. Section 4 presents results of the estimation of the basic model, focusing on FDI inflows. Section 5 outlines a robustness check and Section 6 focuses on provincial and industry heterogeneity. Section 6 concludes.

2 Theoretical background

In this section we lay down the basic framework we will use to estimate financial constraints in China. We use the Euler-equation specification of investment, a structural model, explicitly derived from a dynamic optimization program under the assumption of quadratic adjustment costs. The main advantage of the model is that under the maintained structure, the model captures the influence of current expectations of future profitability on current investment decisions. If the investment decision is taken independently of financial constraints, then current or lagged financial variables should not play a significant role. Numerous studies have used Euler equations to study financing constraints. Until now there are only a handful of papers that study the investment behavior of firms

in transition countries. (Konings, Rizov, and Vandenbussche (2003); Lizal and Svejnar (2002); Anderson and Kegels (1997); Budina, Garretsen, and de Jong (2000)). Our paper estimates the impact of financial constraints on investment for different types of firms in China.

To motivate the empirical identification of financial constraints on investment, we follow the Euler equation governing the optimal level of investment under quadratic adjustment costs as well as agency costs associated with borrowing from imperfect capital markets. The advantage of the Euler model over the Tobin's Q model of investment is that Tobin's Q has to be calculated using stock market data. Our data set does not allow this as we in clude also firms that are not public. We closely follow Harrison, Love, and McMillian (2004) and define the value of the firm as:

$$V_t(K_t, \xi_t) = \max_{I_{t+s}{}_{s=0}^{\infty}} D_t + E_t \left(\sum_{s=1}^{\infty} \left[\Pi_{k=1}^{s} (1 + r_{t+k})^{-1} \right] D_{t+s} \right) \tag{1}$$

where

$$D_t = \Pi(K_t, \xi_t) - C(K_t, I_t) - I_t \tag{2}$$

$$K_{t+1} = (1 - \delta) K_t + I_t \tag{3}$$

$$D_t \geq 0 \tag{4}$$

Where D_t is the dividend paid to shareholders, β_{t+s-1} the discount factor, K_t is the capital stock at the beginning of the period, I_t is the investment expenditure and δ is the depreciation rate. The restricted profit function is denoted by $\Pi(K_t, \xi_t)$, where ξ_t is a productivity shock. The profit function is concave and bounded. The time to install one unit of capital is one. Investment is defined as: $K_{t+1} = I_t + (1 - \delta)K_t$ and δ represents the depreciation rate. The cost to install the capital is given by $C(K_t, I_t)$ and is assumed to result in a loss of a portion of investment. The price of capital is the numeraire.

We can now compute the first-order condition:

$$\begin{aligned} \frac{\partial V_t(K_t, \xi_t)}{\partial I_t} &= -1 - \frac{\partial C(I_t, K_t)}{\partial I_t} \\ &+ E_t \left[(1 + r_{t+1})^{-1} \frac{\partial V_{t+1}(K_{t+1}, B_{t+1}, \xi_{t+1})}{\partial K_{t+1}} \right] = 0 \end{aligned} \tag{5}$$

Substituting now the first order condition (5)into the maximized Bellman equation,

we obtain the Euler equation:

$$1 + \frac{\partial C(I_t, K_t)}{\partial I_t} = E_t \left(\frac{1}{1+r_t} \right) \left(\frac{1+\lambda_{t+1}}{1+\lambda_t} \right) \left[\frac{\partial \Pi_{t+1}}{\partial K_{t+1}} - \frac{\partial C_{t+1}}{\partial K_{t+1}} + (1-\delta) \left(1 + \frac{\partial C(I_{t+1}, K_{t+1})}{\partial I_{t+1}} \right) \right] \quad (6)$$

If $\lambda_{t+1} = \lambda_t = 0$ then we are in a perfect capital market and the external costs of financing is 1[1]. In this model financial constraints(Ω) are represented by the relative shadow costs of external financing of period $t+1$ and t, more formally:

$$\Omega_t = \frac{1+\lambda_{t+1}}{1+\lambda_t} \quad (7)$$

If the shadow cost of external funds is higher in period t than in period $t+1$, so $\Omega < 1$, then current funds are relative more expensive today than tomorrow. In this case we say that the firm is financial constraint. If the shadow cost ($\Omega > 1$) then current funds are less expensive than tomorrow and the firm will invest today.[2] In a perfect capital market we expect that the non-negativity constraint on D_t is not binding, thus the shadow costs $\lambda_{t+1} = \lambda_t = 0$ for all time periods.

Commonly in the literature financing constraints are measured by the sensitivity of investment with respect to internal generated funds. The sensitivity of investment to internal generated funds, or cash flow, is a well reported fact in the literature (Fazzari, Hubbard, and Petersen (1988a) and Carpenter and Petersen (2002)). This stands in contrast to the theory, which states that investment should be independent of the financial structure of the firm, the famous Modigliani and Miller (1958) theorem. The key insight was that a firms financial structure does not affect its market value if capital markets are perfect. Empirical analysis have shown that this does not necessary hold. Therefore, only if the Miller-Modigliani assumptions of constant returns to scale, complete information and perfect capital markets are satisfied, real firm decisions should be independent of financial factors such as liquidity or debt leverage. However, in the context of transition economies where capital markets are just emerging and in the face of substantial information asymmetries, the assumption of perfect capital markets is harder to defend. As pointed out by Stiglitz and Weiss (1981), under the presence of asymmetric information

[1]Another possibility would be if $\lambda_{t+1} = \lambda_t \neq 0$, then current firms are constrained by the same factor in period t and $t+1$. Since the shadow cost depends also on the productivity shock ξ_t it is unlikely that $\lambda_{t+1} = \lambda_t$ in all periods, although for some firms in some periods this is possible. Still we argue as in **?** and belief that in estimating ownership-wide constraints given firm specific investment opportunities such a situation is unlikely to occur.

[2]In this case the firm is more likely to invest at time t, since the discount factor $\frac{1}{1+r_t}$ is increased by the amount Ω, (i.e. the interest rate is lowered).

between borrower at lender, the substitutability of internal and external finance does not hold any more.

We assume that firms make their decision for period t investment at the beginning of the year. Therefore the decisive value of cash flow is in period $t-1$ since the firms gauges its previous cash flow to take the current investment decision. The functional form of our financial constraint measurement looks like the following:

$$\Omega_{i,t} = \alpha_{0,i} + \alpha Cashflow_{t-1} \tag{8}$$

In our paper we focus on consequences of institutional imperfections in Chinese credit markets, the political pecking order, that lead to a gap between the costs of internal vs. external finance. For private firms in China, the main instrument of financing is debt financing.[3] Despite a growing informal financing channel, Allen, Qian, and Qian (2005), the banking sector is still the primary source of credit.[4] The most important determinant of access to bank loans, according to Ayyagari, Demirg-Kunt, and Maksimovic (2007), is the ownership type of the firm and the ability to post collateral, which is in turn a function of firm size, level of fixed assets and firm location.

For Chinese banks the allocation of credit is associated with high financial risks. The high financial risks when lending to private enterprises, however, not only result from the information asymmetry problem between banks and firms, see Beck, Demirguc-Kunt, and Maksimovic (2005), but are also a result of the unfavorable political environment towards the private sector (Huang (2004), Gregory, Tenev, and Wagle (2000)). In particular, private Chinese firms face s severe "political pecking order" for credit by Chinese banks.[5] Chinese banks are predominately owned by the state. The four giant State-owned commercial banks - the Industrial and Commercial Bank of China, the Agricultural Bank of China, China Construction Bank and the Bank of China - hold more than 50 percents of all banking assets and are therefore the biggest creditors in China. These banks lend preferably to State Owned Enterprizes and make it difficult for private firms to get the necessary financing for their investment projects, see Hericourt and Poncet (2007).

As Allen, Qian, and Qian (2005) and Cheng and Degryse (2005) argue, State Owned

[3]Equity financing from the stock exchanges in Shanghai and Shenzen is almost uniquely distributed to State Owned enterprises. In 2000, only 37 out of 976 listed firms were private firms and could raise only 3.9 percent of total funds, Huang (2004).

[4]Ayyagari, Demirg-Kunt, and Maksimovic (2007), using a survey conducted by the World Bank in 2004, found that the percentage of firms using the informal sector is, despite its weaknesses, relatively small. Firms that could obtain financing from the formal financial system are associated with faster firm growth.

[5]Despite the political environment, other potential sources of agency problems that result into high financial risks associated with lending to private enterprises stem from low accounting standards and unprotected private property rights, Asian Development Bank (2003).

banks have maintain a hierarchy in their lending practice. Above of all, State Owned Enterprizes have preferable access to credit, follow by Collective Owned Enterprises, which correspond to Township Village Enterprises (TVE), and lastly the private sector. Dougherty and Herd (2005) report that SOEs absorbed most of the funding from the financial system whereas private enterprises have received only 17% of total loan balances. Huang (2004) argues that for private firms competing with State Owned Enterprises in the same sector and on similar products obtaining credit is even more difficult. The inefficient allocation of credit is mirrored in the growing amount of Non Performing Loans. As Xu (2005) emphasizes, due to poor risk management and the fact that most credits were granted to badly performing State Owned enterprises, the amount of Non Performing Loans has become a major concern of the Chinese Economy. According to the China Banking Regulatory Commission, the share non performing loan to total loans granted peaked in 2003 by around 15.9 % and dropped slightly to 13% by the end of 2005.

One way private firms could overcome credit constraints was to engage into a joint venture with foreign investors.[6] In general, these joint ventures were planned to be beneficial for both sides, the foreign investors and the Chinese partner. On the one hand side foreign investors benefit from central or local government support, brand reputation, land, licenses, distribution and access to suppliers that reduce start up costs and improve the foreign investor's chances of success. On the other hand private Chinese firm could take advantage of knowledge spill-overs and, more importantly, access to foreign capital. The equation to test the hypothesis that Foreign Direct Investment(FDI) reduced financial constraints for private Chinese firms engaged in a joint venture is the following:

$$\Omega_{i,t} = \alpha_{0,i} + (\alpha_1 + \alpha_2 WFOE_i + \alpha_3 JV_i + \alpha_4 FISH_i + \alpha_5 SOE_i + \alpha_6 COE_i) Cashflow_{i,t-1} \quad (9)$$

The effect of the financing constraints caused by political and institutional restrictions will be captured by the distinguishing between State Owned Enterprises(SOE), Wholly Foreign Owned Enterprises(WFOE), Foreign Investment Share Holdings(FISH), Joint Ventures(JV), Collective Owned Enterprises(COE) and private domestic firms. In a perfect capital market, future investment decision should depend only on the expected future profitability of capital, $(\partial \Pi \setminus \partial K)_{t+1}$, and not related to internal funds $\alpha_i Cashflow_{i,t-1} = 0$. The main argument of our paper is that private firms are finan-

[6]Other possible ways to obtain external finance would be from the informal sector. Indeed Allen, Qian, and Qian (2005) argue that in the absence of an efficient formal financial sector, there exist effective alternative financing channels and corporate governance mechanisms such as those based on reputation and relationships to support the growth of the Private Sector. Based on the Investment Climate Survey conducted by the World Bank, Ayyagari, Demirg-Kunt, and Maksimovic (2007) investigate the financial system in China and which firms does the informal sector primarily serve. They find little evidence that the formal system in China is being bypassed or that the informal system is a good substitute for fast growing firms.

cial constraint, $\alpha_1 > 0$, and if firm's financial constraints decrease with capital market imperfections, then the respective interaction term of cash flow and ownership, α_2 to α_6, should be negative. By focusing on Joint Ventures, we pick up the effect of Chinese firms that have access to foreign capital and expect that these firms have a lower sensitivity of investment to cash flow. If FDI reduces the sensitivity of investment to internal funds, then $\alpha_3 < 0$. We even require that $\alpha_1 + \alpha_3 JV_i = 0$ meaning that Joint Ventures are not financially constrained. Similarly, we expect that State Owned Enterprises and Wholly Foreign Owned Enterprises are neither financially constrained.

To derive the estimation equation, we assume a constant returns to scale production function with quadratic adjustment costs of investment given by the following functional form $C(I_t, K_t) = a/2(I/K - \nu)^2 K_t$ to obtain the following expression for the costs of investment.

$$\frac{\partial C(I_t, K_t)}{\partial I_t} = \frac{a}{2}\left(\frac{I}{K}_t - b\frac{I}{K}_{t-1} - \nu_i\right) \tag{10}$$

Similar to the previous literature, Harrison, Love, and McMillian (2004) and Love (2003), we include the lagged investment to capital ratio in the cost function. The marginal product of profits with respect to capital, $\frac{\partial \Pi}{\partial K}$, can easily be derived from the profit maximization problem as a function of sales to capital ratio. The derivations and arguments in support of this measure over other alternative measures can be found in appendix. The functional form is given by:

$$\frac{\partial \Pi}{\partial K} \approx \alpha_K \left[1 + \frac{1}{\eta}\right] \frac{S}{K} - \omega \frac{L}{K} \tag{11}$$

where S/K is a sales to capital ratio, η is the elasticity of demand, ω is the wage and L/K represents the labor to capital ratio. This representation focuses on the variation in the sales to capital level around the industry-ownership specific mean, that is, the within-firm variation in the productivity of capital at the industry level for each type of ownership.

In order to proceed to the estimation equation(6) we conduct a first order Taylor approximation to linearize the Euler equation. We evaluate the function representing financial constraints around $E[\Omega] = 1$, where the firm is expected to be not financially constrained.

$$\Omega_t(\frac{\partial \Pi}{\partial K}_{t+1} + (1-\delta)(1 + \frac{\partial C(I,K)}{\partial I}_{t+1}))_t = \Omega_t + \frac{\partial \Pi}{\partial K}_{t+1} + (1-\delta)(1 + \frac{\partial C(I,K)}{\partial I})_{t+1} + \gamma \tag{12}$$

γ is the unconditional mean and includes all constant factors of the approximation. This allows us to transform the Euler equation (6) into a linear equation.

$$1+\frac{a}{2}\left(\frac{I}{K}_t-\nu_i\right)=\frac{1}{1+r_t}\left(\Omega_t+\left[1+\frac{1}{\eta}\right]\frac{S}{K}_{t+1}-\omega\frac{L}{K}_{t+1}+(1-\delta)(1+\frac{a}{2}(\frac{I}{K}_{t+1}-\nu_i))\right) \tag{13}$$

Moreover, if we assume relational expectations, we can replace the future realizations of the variables with the real terms together with a measurement error $\epsilon_{i,t}$. We get the a simple estimation equation of financial constraints by substituting equations (9), (10) and (11) into the Euler equation (6) and by using the linearization in (12). Thus, the empirical equation that we seek to estimate has the following standard specification:

$$\begin{aligned}
\frac{I}{K}_{i,t} &= \beta_0\frac{K}{I}_{t-1}+\beta_1\frac{Sales}{K}_{j,g,t}+\beta_2\frac{Cashflow}{K}_{i,t-1}+\beta_3\frac{Cashflow*WFOE}{K}_{i,t-1} \\
&+ \beta_4\frac{Cashflow*JV}{K}_{i,t-1}+\beta_5\frac{Cashflow*FISH}{K}_{i,t-1}+\beta_6\frac{Cashflow*SOE}{K}_{i,t-1} \\
&+ \beta_7\frac{Cashflow*COE}{K}_{i,t-1}-\beta_8\frac{L}{K}_{t,i}+\beta_9 WFOEDum_i \\
&+ \beta_10 JVDum_i+\beta_11 FISHDum_i+\beta_{12}SOEDum_i+\beta_{13}COEDum_i \\
&+ ProvinceDum_j+TimeDum_t+\alpha_i+\epsilon_{i,t}
\end{aligned} \tag{14}$$

Our empirical model, the Euler approach towards the optimal level of investment, relates investment to the internal generated funds of firms, Fazzari, Hubbard, and Petersen (1988a). Gross investment $I_{i,t}$ at the firm level i is defined as the change in the tangible assets plus depreciation of the firm i at time (t) - $(t-1)$, Sales are the average real sales of industry j of ownership g at time (t), Cash flow is the real cash flow of the firm i at time $(t-1)$ with interaction terms of State Owned Enterprises, Collective Owned Enterprises and Foreign Invested Enterprises (FIE), that are further separated into Wholly Foreign Owned Enterprises (WFOE), Joint Ventures (JV) and Foreign Investment Share Holdings (FISH). The number of employees are defined as L. K is the level of the real capital stock (proxied by total assets) and j refers to province j. α_i represents the firm specific unobserved effect while $\epsilon_{i,t}$ is a white noise error term. We also include provincial and time dummies. Moreover, we divide all regression coefficients, except the dummies, by the capital stock in order to control for size effects.

As discussed above, real sales ($Sales$) and the labor to capital ratio (L/K) proxy for the marginal product of profits with respect to capital as it is conceivable that higher investment leads to higher sales and a higher capital to labor ratio. The coefficient β_2 captures the sensitivity of firm-level investment with respect to the internal financing of all firms and constitutes the coefficient of interest. It is suspected to be positive if firms face financial constraints. Introducing interaction terms of cash flow with different own-

ership types allows us to test whether these groups face a significant different dependence of investment on internal funds to the reference group, in our case the private domestic firms. β_3 to β_7 in equation (14) measuring the sensitivity of cash flow of State Owned Enterprises (SOE), Collective Owned Enterprises (COE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures (JV) and Foreign Investment Share Holdings (FISH). We focus on the coefficient β_4 in equation (2), which measures the dependency of investment to cash flow for Joint Ventures. If Chinese firms could reduce their financing constraints significantly by engaging into a Joint Venture and using foreign capital to realize additional investment, this coefficient should be negative. Hence, the total sensitivity of investment to cash flow is lower for private firms engaged in Joint Ventures indicating that FDI reduces financing constraints. Alternatively, a positive coefficient would point out a crowding out effect.

Subsequently, we expect a negative coefficient on the cash flow of state owned and collective owned firms to capture the political pecking order. The coefficients β_3 and β_5 measure the sensitivity of Investment to Cash flow for WFOE and FISH with respect to the reference group are expected to be also negative as foreign injected capital in China reduces financing constraints. We include dummies for each ownership ($WFOEDum_i$, $JVDum_i$, $FISHDum_i$, $SOEDum_i$, $COEDum_i$) in order to account for ownership specific attributes.

We will estimate this model with a pooled OLS and random effect regression in order to include time invariant variables, what is not be possible under fixed effects. Using pooled OLS comes at the expense of assuming no correlation between the regressors and the error term. This assumption is problematic in so far as there should be any correlation between investment unobservables and firm specific characteristics collected in $cashflow_{i,t}$ and $Sales_{j,t}$. This assumption is likely to fail in our framework. In the random effect case, we relax this assumption by including an unobserved effect to capture firm specific characteristics that are constant over time and orthogonal to the explanatory variables.

If we allow now for arbitrarily correlation between the firm's specific unobserved effect and the explanatory variable, we can estimate equation (14) using fixed effects. Fixed effects analysis allows us also to control for unobserved cross section heterogeneity and time-constant omitted variables that can be arbitrarily related to the explanatory variables. Additionally, we allow for arbitrary serial correlation and time varying variances. The main disadvantage using fixed effect is that omitted variables have to be time invariant in order to consistently estimate financial constraints. Nevertheless, investment regressors - cash flow in particular - are likely to be correlated with unobservable investment specific characteristics. For example, if the cash flow contains information about the future profitability of the firm, which is not observable. Further below, we present an-

other strategy of solving the problem of endogeneity. In both regressions, we use clustered standard errors to allow for correlation in investment behavior across ownership types.

Finally, we test for sample selection bias and attrition. Sample selection could arise if firms are selected on their investment behavior. Attrition may occur because some firms may leave the sample for reasons that are not purely random, e.g. misreporting or bankrupt. In both test we include proxy variables following Wooldridge (2002). Furthermore, in these test the unobserved firm effect is allowed to be correlated with the investment regressors and the selection rules may depend in the unobserved effect.

3 Data

The data that we use are firm level data originating from the data set ORIANA. This database contains detailed financial information on contact information, activities, 180 financial items and 105 ratios and ownership of more than 20,000 Chinese firms in the time period of 2000 to 2005. We distinguish among different types of legal ownership: State Owned Enterprises, Collective Owned Enterprises, Foreign Invested Enterprises which can be further divided into Wholly Foreign Owned Enterprises, Joint Ventures or Foreign Investment Share Holding, and private Chinese companies.[7]

A firm is classified as a State Owned Enterprise (SOE) if the ownership share of the state (no matter whether direct or indirect) is more than 25 percent, otherwise we assume that the influence of the government is too weak. These firms can either be fully State-owned or Jointly State-owned.[8]

Private firms in our sample refer to profit-making economic organizations, which are invested or controlled by the natural persons and are in accordance with Company Law of the People's Republic of China. The legal form of private Chinese firms can be either sole proprietorships, partnerships, limited liability companies, or shareholding cooperatives. Shareholding Corporations, which are publicly listed on the stock exchange, comprise a category of domestic enterprises separate from private firms. In our sample we treat them as private firms as long as the state, or a foreigner, has not more than 25 per cent share.[9]

[7]The ownership status is a static variable as our data base does not allow to track back ownership changes. Previous versions range back until 2006, the last year of our sample period, and contain only 20 percent of the firms of our sample.

[8]see also Huyghebaert, Quan, and Sun (2006).

[9]Another form of indidivdual businesses, known as Getihu, are not included in the data set since they are by law not allowed to have more than eight employees and are thus too small to be included.

Another category of "nonstate" firms in China is denoted by Collective Owned Enterprises (COE). This category encompasses urban and rural collectively owned enterprises, also called township and village enterprises (TVEs). The collective-owned enterprise refers to the socialist public ownership enterprise with means of production and property belonging to laboring masses. The laboring masses work together based on the principle of distribution according to work, reasonably share the profit, and win certain accumulated public fund. The collective-owned enterprise is independent economic organization and legal corporation engaged in production, operation activities and independent accounting, with self-management and self-responsibility for the profit and loss. Collective Owned Eenterprises are classified outside the state sector, and yet cannot be considered part of the private sector in a strict sense of the word, Asian Development Bank (2003). For this reason it is important to distinguish the financial treatment between them.

In our analysis we focus mainly on different corporate organizations founded by foreign investors in China. In general, a Foreign Invested Enterprise refers to any enterprise domiciled in mainland China that has at least 25 percent of the total equity stake of the firm owned by a foreign entity. Foreign Invested Enterprises have a particular legal status in the Chinese law.[10] Foreign Invested Enterprises either refer to Joint Ventures, Wholly Foreign Owned Enterprises or Foreign Investment Share Holdings.

"Wholly Foreign Owned Enterprises"(WFOE) are all firms with an ownership share of 100 percent or the legal status indicates that the enterprize is wholly invested in the mainland of China by foreign a entity according to provisions of Law of The People's Republic of China on Foreign-Capital Enterprises[11] and related laws.

Joint ventures are defined according to the Company Law of the People's Republic of China which states that Joint Venture must be jointly established by foreign companies, enterprizes and other economic organizations or individuals, and Chinese companies, enterprizes or other economic organizations. The parties agree to create a new entity by both contributing equity and then share the revenues, expenses, and control of the enterprize. In the registered capital of a joint venture, the proportion of the investment contributed by the foreign party shall not be less than 25 percent. According to the Chinese legal system, the technology and equipment contributed by any foreign party as investment shall be truly advanced and appropriate to China's needs. Joint Ventures are allowed to

[10]Company Law of the People's Republic of China, Law of the People's Republic of China on Chinese-Foreign Equity Joint Ventures, Law of the People's Republic of China on Chinese-Foreign Contractual Joint Ventures, and Law of the People's Republic of China on Foreign-Capital Enterprises.

[11]The foreign capital enterprizes mentioned in this law refer to enterprizes established in the territory of China with all their capital exclusively invested by foreign investors in accordance with relevant Chinese laws, not including branches of foreign enterprizes and other economic organizations which are located in the territory of China.

finance themselves from abroad under the supervision of the Chinese Government.

It should be noted that the Chinese usage is more encompassing than western business standards. In standard business terms, joint ventures, refers to an enterprise where the two parties have joined and shared control. However, establishing a joint venture in China, the prescription of a venture contract allows that the foreign party to own 9 percent of the equity but the company is still representing a joint venture provided it is in accordance with the provisions of the law. Such firms are usually known as majority-owned plant in which the majority shareholder exercises operating control. We assign these firms to the Joint Venture group.[12]

The Foreign Investment Share Holding (FISH) company refers to the share holding limited company, which is based on states related provisions and approved by the Ministry of Foreign Trade and Economic Cooperation P.R.C, with stocks of foreign investors accounting for over 25% of the total registered capital. The establishment of a Foreign Investment Share Holding (also known as a "joint stock company") was designed to accommodate investors seeking to issue shares to the public or to list on the Shanghai, Shenzhen or foreign stock exchanges (under Chinese foreign investment law nomenclature, the Hong Kong Stock Exchange qualifies as a "foreign" stock exchange). In general, the establishment of a FISH is subject to stricter conditions than the establishment of Joint Ventures and Wholly Foreign Owned Enterprises. [13]

Further selection criteria to be included in the data set are that the companies report at least two consecutive years. Moreover, we use only firms that report consequentially. Firms that leave the sample in one year and reenter in another year are suspected to misreport and are thus excluded. We also delete the upper and the lower one percentile of the distribution of the dependent variable to get rid off outliers. Table 1 describes the number of firms according to their ownership structure. The sample contains 19126 firms of which 3776 are private domestic firms, 2891 collective-owned enterprises ,5791 state-owned enterprises and 6668 are foreign firms. Joint Ventures represent the biggest share of foreign firms with 4428 firms. If we compare this data set with the China Economic Census Yearbook 2004, to have an idea how representative our data base is, our sample covers slightly more than 10% of all large firms operating in China.

Table 1 include here!

[12]This type of ownership pattern is possible although rare. We have 29 firms in our sample where the legal status indicate a Joint Venture and the foreign parties hold more than 50 percent ownership.

[13]More detailed information can be obtained from the "Liaoning Provincial Online Foreign Trade Information Center".

Table 2 reports the summary statistics of the firms covered by our sample. The values represent the statistical means together with the standard errors over the observed period. We use gross total assets to measure the size of the firm. The growth rate of firm is measured by the log change in total assets. Doing this allows us to capture a broad range of activities undertaken by the firm as we take not only physical but also working capital into account. We define the change of investment as the change in tangible assets. Almeida and Campello (2006) argue that excluding intangible assets (patents, copyrights, trademarks, etc) from the definition of investment reduces asymmetric information problems. Tangible asset are easier to observe and reduce possible measurement errors. In order to control for size, we divide the average cash flow of each firm by total assets. We include the Return of Investment (ROI), which contains information about the profitability of the overall operation of the firm and can be seen as an indicator of the efficiency of investment. The ROI is defined as the ratio of investment to total assets. Hence, the efficient firm will be able to increase total assets more through investing into equipment.

Table 2 include here!

On the left side of table 2, we focus on the four private firms, State owned , Collective owned, and Foreign Invested (FIE) Enterprises. On right side we present summary statistics for different types of foreign firms. The first row reports the median firm's growth rate for the respective ownership type. Collective Owned firms are growing at the lowest pace with 3.2 percentages per year, whereas foreign firms grow almost 13 percent per year reflecting the economic strength and growing importance of Foreign Invested Enterprises in China.

In the second row we focus on the growth rate of investment. Due to its high degree of variation within the private and state owned sector, we are unable to test which group increases its investment from one year to the other significantly more. Focusing only on the mean, leaving the distributional properties aside, State Owned firms increased their investment on average more than the others. This result stands in contrast to Huang (2004), who shows evidence that foreign enterprises investment more than domestic Chinese firms.

If we take the return of investment (ROI) ratio into account, which measures the investment intensity relative to its total assets, then the results suggest that SOEs increased their investment on average the most but are the least efficient investors. The average Return of Investment (ROI) is with 14.6 percent significant lower than the Return on Investment from private, collective and foreign firms. Following this interpretation, collective owned and foreign owned firms manage to invest their capital more effectively. However, all groups of ownership have a positive return on investment indicating that the average firm in our sample invests profitable.

The third row reports the firms average cash flow scaled by beginning-of-period total assets. The ratio of 0.22 for private Chinese firms is significant higher than for other types of firms. If we compare the values with other studies[14], then the ratio is on average much higher, indicating that internal funds are an important source of funds in China.

In the fourth row table (2) shows the average growth rate of sales. In the literature the growth rate of sales is interpreted as an indicator of investment opportunities. Sales of foreign firms are growing at the fastest pace with a mean of 35 percent per year.

Focusing on the fifth row, the debt ratio, we observe that FIE have the lowest ratio of debt to assets, whereas private domestic firms have the highest debt ratio. Since the debt ratio, measured by total debt divided by total assets, shows how the company can meet its total obligations from equity, we use it as a control variable for credit worthiness in our empirical analysis. The last two rows report the size of the firms by using the average amount of total assets and the mean employment level. SOE's are the biggest firms in terms of assets, on average 4 Billion $, as well as employment with a mean of 3742. Private and collective owned firms are in average the smallest firms with around 800 Million $ worth of assets and an average employment level of 1566 and 1595 respectively. In the literature, Carpenter and Petersen (2002) and Bond, Elston, Mairesse, and Mulkay (2003), size is to be found an important determined of financial constraints since banks give bigger firms preferential access to credit. Hence, in our empirical model, we take size into account by dividing all regression coefficients through total assets.

On the right side of table 2, we show the summary statistics of Foreign Invested Enterprises (FIE) split into three groups: wholly foreign owned, joint ventures and foreign invested share holdings. Foreign Investment Share Holdings are by far the biggest firms with an average employment of 16451 and total assets worth 19.3 Billion $ in comparison to an average employment level of 1045 for wholly foreign owned and 1484 for joint ventures with total assets 595 Million $ and 500 Million $ respectively. Furthermore, foreign share holgings have a significant lower debt level and the highest return on investment. Wholly Foreign Owned Firms and Joint Ventures do not distingish themsleves significantly.

[14]Carpenter and Petersen (2002) and Griliches and Hausmann (1986) use a US sample of manufacturing firms from the period 19801992 and report a ratio of 0.06. Bond, Elston, Mairesse, and Mulkay (2003) conducted a sample of manufacturing firms in Belgium, France, Germany, and the United Kingdom, covering the period 19781989 and found ratios ranging from 0.11 in France to 0.13 in the UK.

4 Empirical estimates

The results using standard OLS are reported in table (3). Investment demand, represented by $Sales_{j,t}$ in equations (1) and (2), enters always highly significant at the 1 percent level. This result reflects the fact that the investment level of a company is strongly determined by its change in sales volume as higher investment is correlated with higher sales. For the labor to capital ratio we obtain, as in our theoretical model, a negative significant coefficient. pointing out that capital-intensive firms investment more. Hence an increase in the investment to capital ratio is associated with a double increase in the capital labor ratio.

The main coefficient of interest is the cash flow that measures the sensitivity of investment to cash flow, thus our proxy for financial constraints. In the first column of table (3), we estimate equation (1) without separating into different ownership groups in order to measure the average sensitivity of investment to cash flow for Chinese firms. The result obtained shows that the $cashflow$ coefficient is significant on the 1 percent level. Hence, the average Chinese firm is financially constraint. Moving now to column (2) where we split the sample into different ownership groups, cash flow remains highly significant. Contrary, the coefficients β_3 to β_5 , the interaction of cash flow with ownership dummies for FIE, COE and SOE, become negative significant. This implies that COEs, SOEs and FIEs have a significant lower sensitivity of investment to internal generated funds than the reference group, the private domestic firms. Moreover, if we perform a t-test to check whether $\beta_2 + \beta_3 * FIE = 0$ and $\beta_2 + \beta_4 * SOE = 0$ the outcome of the test shows that the coefficients are not significant different from zero. This means that SOEs and FIEs do not face financial constraints in their investment decision and are able to raise financing independent of their internal generated funds. In the case of Collective Owned firms, he performed t-test $\beta_2 + \beta_5 * COE = 0$, rejects the null hypothesis indicating that COEs face credit constraints but at a significantly lower degree than private firms.

Table 3-5 include here!

In column (3), we use the same framework to test for financial constraints for different types of foreign ownership by splitting the foreign firms into wholly foreign owned enterprises, joint ventures and foreign investment share holdings. As expected, the cash flow coefficient for wholly foreign owned enterprises (WFOE) is significant and negative showing that wholly foreign owned firms do not face financial constraints as they have access to foreign capital in order to finance their investment. The cash flow coefficient for Joint Ventures(JV) allow us to test the political pecking order and is the coefficient of interest. Table (3) shows that the estimated coefficient is negative and statistically significant. This indicates that domestic Chinese firms could reduce their sensitivity to

the cash stock through the access to foreign capital. We conduct a t-test to check whether $\beta_2 + \beta_5 * JV = 0$ and cannot reject the null hypothesis. Hence, Chinese firms receiving Foreign Direct Investment do not face financial constraints. We interpret this result as evidence that FDI brought scarce capital into the Chinese economy and allows firms to undertake investment that would have not been implemented.

In column (4) - (6), we include control variables as cash flow is likely to be correlated with specific firm level attributes, which expand the availability of domestic credit and investment. We include the debt ratio, defined by total debt divided over total assets, as proxy for the financial health of the firm. As stated above, firms with a lower level of leverage, consequently a higher level of equity, are gauged as less risky and should have better access to credit. The squared cash flow term proxies for the non-linearity of the sensitivity of investment to cash flow. As a result, the magnitude of the coefficients representing financial constraints change slightly but the results remain in their interpretation unchanged.

Next, we introduce a time-invariant unobserved effect α_i into equations (1) and (2) to control for unobserved heterogeneity. Table (4) reports the estimated coefficients using random effects. The results obtained are not systematically different from the estimated coefficient using pooled OLS. In table (5), we estimate equation (1) and (2) using fixed effects. The interaction between Cash flow and Foreign Invested Enterprises, and in particular Joint Ventures, remains large and statistically significant. Contrary to the previous obtained results, cash flow of Foreign Investment Share Holdings (FISH), table (5), is now statistically significant pointed out that also FISH have significant lower financial constraints than private firms. Using the Hausman test, we can compare the results obtained via OLS, RE and FE. Under the assumption of strict exogeneity, a statistically significantly difference is interpreted as evidence in favor of the fixed effect estimates. The test results are reported at the bottom of table (5) and show a statistical significant difference.

In sum, the results obtained support the argument of Huang (2004) that in China credit is allocated in a "political pecking order". Private firms are financially constrained in their investment decision and face the most severe financial discrimination in China. Private firms that benefited from Foreign Direct Investment by engaging into a joint venture could overcome their dependency on internal financing through the access to foreign capital. Contrary, collective Owned firms, although financially constrained, dependent less on internal financing than private firms. In the case of State Owned enterprises, we find that investment does not depend on internal generated funds and are suspected to soft budget constraints.

Overall, our results also indicate that FDI inflows reduced the sensitivity of investment

to cash flow significantly for all types of enterprises. Wholly foreign owned enterprises and joint ventures are able to realize their investment without relying on internal generated funds. The results confirm this view and show direct evidence that FDI brings in scarce capital and eases financing constraints, which is in contrast to other studies, Harrison and McMillian (2003) that foreign capital did crowd out domestic capital.

5 Robustness Check

The results obtained on the basis of the estimation of (1) and (2) can be subject to firm specific issues and endogeneity issues. Carpenter and Petersen (2002) developed an alternative way to test for credit constraints at the firm level. Although the regression exhibits some similarities to that used above and much of the subsequent literature, there are two important differences. First, the dependent variable is the growth rate of the firm, not the fixed or tangible investment ratio commonly used in the literature. We measure firm growth as the log change in total assets and expect to lower potential measurement errors involved with determining depreciation as it is the case by using the change in tangible assets as investment proxy.

Another advantage of using the growth of total assets is that we capture a broad range of activities undertaken by the firm. As firms grow, they expand not only their physical capital, but also gross working capital (such as inventories, cash and equivalents, and accounts receivable). By examining the change in total assets, we include all the firms potential investment uses of internal finance, which permits us to make a quantitative prediction about the relationship between firm growth and internal finance.

The second difference is the models inclusion of highly disaggregated time dummies. Virtually all studies use time dummies defined at an aggregate level, which removes cyclical variation common to the entire manufacturing sector. In contrast, time dummies defined at the two-digit level control for all shifts in investment demand or expectations due to changes in industry-level conditions (for example, industry-wide technology changes, industry demand shocks, or the entry of new firms). $SectorTimeDum_{k,t}$ represents this set of time dummies and is defined separately for each industry at the 2 digit NACE 1.1 level represented by subscript k and time t . Their specification is as follows:

$$
\begin{aligned}
log(K)_{i,t} &= \beta_0 log(K)_{i,t-1} + \beta_1 \frac{\Delta Sales}{K}_{i,t} + \beta_2 \frac{Cashflow}{K}_{i,t-1} + \beta_3 \frac{Cashflow * WFOE}{K}_{i,t-1} \\
&+ \frac{Cashflow * JV}{K}_{i,t-1} + \frac{Cashflow * FISH}{K}_{i,t-1} \\
&+ \beta_6 \frac{Cashflow * SOE}{K}_{i,t-1} + \beta_7 \frac{Cashflow * COE}{K}_{i,t-1} + \beta_8 WFOEDum_i \\
&+ \beta_9 JVDum_i + \beta_{10} FISHDum_i + \beta_{11} SOEDum_i + \beta_{12} COEDum_i \\
&+ ProvinceDum_j + SectorTimeDum_{k,t} + \alpha_{i,t} + \epsilon_{i,t} \qquad (15)
\end{aligned}
$$

Table 6-8 include here!

Tables (6) to (8) check the robustness of the previous obtained results to the model specification. The significance of the estimated coefficients in both tables does not change in comparison with the one estimated in table (3) to (5). In term of magnitude of the coefficients, the values are significant smaller than under the standard investment model in table (3) and (4). In general, we obtain for both models, the standard investment model and the growth rate of firm model, that investment and the growth rate of the firm are sensitive to the cash stock, but this sensitivity is significantly reduced by inflows of foreign direct investment. In addition, foreign direct investment has a direct positive effect on firm level investment and the firm level growth rate. We conclude that these results are not driven by model choice.

Finally, we test for the presence of sample selection bias and attrition bias in both specifications. The selection bias could arise if the decision of firms being included in the sample would not be random. Following a Nijman and Verbeek (1992), we perform a simple test by including a lagged selection indicator in the fixed effects regression. Our results show that there is no evidence of a sample selection bias.[15]

However, we still expect to have a problem of endogeneity in our model. According to the literature,[16], the marginal product of capital is suspected to be mismeasured and consequently variables such as cash flow and investment opportunities are correlated with these measurement errors. Another important source of a potential endogeneity problem stems from the fact that the change of real sales may be a poor proxy for investment opportunities, Hubbard and Kashyap (1995). In particular, if the firms cash position contains information about its investment opportunities what leads to an increase the bias arising from the measurement error. For example, if managers tend to accumulate cash

[15]The respective $t - statistic = -0.91$ and $p - value = 0.364$ for the selection indicator are in the investment specification and $t - statistic = -0.77$ and $p - value = 0.422$ in the growth equation.

[16]see Hubbard (1998) for a summary

when they are highly profitable.

The best solution to address the endogeneity problem would be a "natural experiment". One could analyze the financial constraints before and after the opening up to foreign capital in certain industries and check whether financial constraints diminished. This method would assure that a firms financial positions is unrelated to their investment opportunities. Unfortunately our data set does not allow us to perform such analysis due to the short sample period. Instead, we include the lagged dependent variable and use lagged values of the explanatory variables as instruments[17] in order to minimize the significance of this measurement-error problem.

Hubbard (1998) states that using lagged variables and controlling for serial correlation structure of the error term could circumvent the correlation between the temporary component and the change in real sales, our investment opportunity proxy. Fazzari et . al [1988, Table 6] find that lags of $\Delta Sales_{i,t}/K_{i,t-1}$ and $CF_{i,t}/K_{i,t-1}$ are statistically significant. Based on formal tests, Blundell, Bond, Devereux, and Schiantarelli (1992) conclude that their residuals are serially correlated and that lagged dependent and independent variables are important in their standard accelerator model of investment.

After testing for endogeneity, we use the two step Arellano and Bond (1992) estimator for both specifications and derive a generalized method of moments estimator. As stated above, investment opportunities are suspected to be endogenous. Hence, we add first order lagged levels of the dependent variables of both regression specifications, which are investment and growth of firm respectively. We use for each time period first differences of the strictly exogenous variables as instruments, in our specification the cash flow together with its interaction terms, the year dummies and the control variables. This method is appropriate provided we treat the lagged levels of investment opportunities as predetermined. The F-test of the joint significance of the instruments are reported at the bottom of table (9) and (10). Additionally, we include the test for first and second order autocorrelation and the Sargan test of over identifying restrictions. Since the Sargan test is only valid under the presence of homoskedasticity, we test whether the assumption of normality of the error term holds. Using the Breusch Pagan test, we reject the null hypothesis of homoskedasticity. In order to control for heteroskedasticity we use the efficient two step GMM procedure. This procedure will allow us to verify the robustness of our OLS, random and fixed effects results reported above.

Table 9-10 include here!

In table (9) and (10), we present the results of the estimation of our investment equa-

[17] see Blundell and Bond (1998), Bond and Meghir (1994)

tion undertaken using our preferred estimator, namely the first-differenced Generalized Method of Moments (GMM) estimator, which takes the endogeneity bias into account. The estimated coefficients of the cash flow variable lie above the corresponding estimates obtained using OLS and the fixed effects estimator although the level of significance does not change. FIE, COE and SOE have a significant lower sensitivity of investment to cash flow than private domestic firms. The Sargan test of over-identifying restrictions does not reject the validity of the instruments, nor is there any second order serial correlation. The results confirm previous results obtained in the literature, namely lagged investment and cash flow are highly positively significant reflecting that last years investment decision and the cash stock are important in determining the actual level of investment.

6 Regional and industry heterogeneity

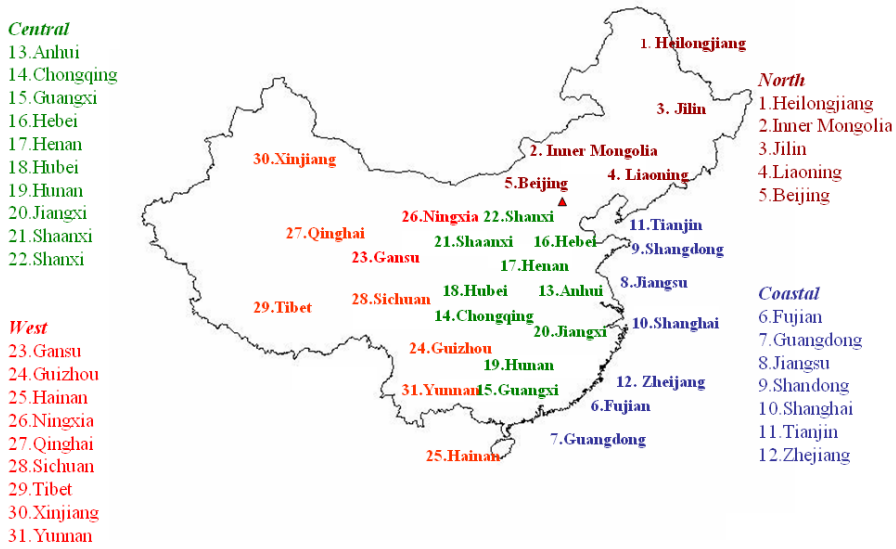
After exploring financing constraints for whole China, we focus in this section on the heterogeneity across provinces and industries. Naughton (2007) points out that FDI has strongly influenced the economic openness of the different Chinese regions as well as the development of the financial markets. At the beginning of 1980, the Chinese government decided to gradually liberalize its regime for inward FDI by creating "special economic zones" (SEZ). These SEZs present geographical regions that have been established to attract foreign investment. [18] The first SEZs were founded in Shenzhen, Zhuhai and Shantou in the Guangdong Province and Xiamen in Fujian Province, and the entire province of Hainan. By the end of 1992, 15 free trade zones, 32 state-level economic and technological development zones, and 53 new- and high-tech industrial development zones have been established. In these zones foreign investment was encourage through lower tax rates, fewer and simplified administrative and costume procedures and, most importantly, duty free import of components and suppliers, Naughton (2007).

FDI has been heavily concentrated in the coastal provinces, which contain all Special Economic Zones (SEZ). From 2000 to 2005 coastal provinces received on average more than 64 percent of total FDI to China.[19] Contrary, western provinces have received less than one tenth of FDI on average between 2000 and 2005 and were responsible for less than 5 per cent of foreign trade (7 per cent in 2005). The rapid expansion of export oriented industries based on imported inputs had accelerated the integration of coastal economies in international trade and production networks but this may have been achieved at the expense of backward and forward linkages with the rest of the economy and especially at the expenses of western inland economies. This fact is also reflected in our data base

[18] SEZs are entitled to set their own policies and allowed to have a more liberal economic law than a country's typical economic law.

[19] China Statistical Yearbook 2005

Figure 1: Provinces in China divided into four groups: Northern, central, western and coastal provinces.



where 80 percent of Foreign Invested Enterprises are located in the coastal provinces and only 4 in the western provinces. A detailed description of the regional division of provinces in China is plotted in figure 1 and table (13).

In order to examine heterogeneity of financing constraints across provinces, we redo the basic specification but we group firms of each province in four main regions: coastal, central, northern and western. Next, we evaluate the sensitivity of investment to the cash flow for each group of provinces and test for significant differences. To control for ownership specific investment across provinces, we include dummies for each ownership group. The coastal provinces like Guangdong, Shangong and Zhejiang that lie in the South-east are supposed to be more economically flexible and are expected to face significant lower financing constraints than the reference group. On the contrary, in northern and western provinces, where local governments discriminate against private firms from outside the region, the political pecking order is expected to be more strictly enforced and should be reflected in a higher sensitivity of investment to cash flow.

Tables 12-13 include here!

Table (12) shows the average financial constraints using pooled OLS and fixed effects of the coastal, northern and western firms in respect to the reference group, the firms located in the central region. A negative coefficient of the interaction terms indicates that the average firm based in that region faces significant lower financing constraints in comparison to the average firm based in the central region. We observe from table (13)

that firms in the coastal region depend less on their internal generated funds than in the other regions. Firms in the northern region do face a significantly higher sensitivity of investment to cash flow from the central region's firms pointing out to a more strict political pecking order. If we use the Arrelano-Bond two step estimator to correct for endogeneity, we obtain similar results as in table (12). Table (13) shows that the average firm from the Northern region faces the highest financing constraints whereas coastal regions have the lowest degree of constraints. The results confirm our prediction that in coastal provinces the local governments are more liberal and the impact of the political pecking order is less severe.

Similarly, we expect differences in the degree of the political pecking order among industries. For example, Huang (2004) argues that the political pecking order in the Garment industry, one of the few industries private entrepreneurs can enter into relatively freely, is characterized by a discrimination of private firms against State owned firms. In particular, firms high on the political pecking order have an advantageous access to credit compared to the lower-tiered firms. If the institutional foundation argument is correct, then one should see that it is more difficult for private firms, lowered-tiered on the political pecking order, to have to access to credit, where the concentration ratio of State Owned Enterprises is high.

In this section, we attempt to demonstrate the effect of the political pecking order of firms on external finance costs of private firms conditional on the concentration of State owned enterprises within an industry.

We calculate the the market share of State Owned Enterprises in each industry by

We calculate for each industry a concentration index of State owned enterprises by dividing the number of state owned firms through the total number of firms within an industry.

Next, we interact the concentration ratio with the cash flow for each ownership type. This allows to evaluate how the sensitivity of investment to cash flow changes as the concentration ratio changes. We expect that private firms have a higher sensitivity of investment to cash flow, thus are more financially constrained, in industries where the concentration ratio is close to 1. To evaluate these industry heterogeneity, we perform the following regression

$$\begin{aligned}\frac{I}{K}_{i,t} &= \beta_0 \frac{I}{K}_{i,t-1} + \beta_1 \frac{Sales}{K}_{jg,t+1} + \beta_2 \frac{Cashflow}{K}_{i,g,t-1} \\ &+ \beta_3 \frac{Cashflow * Concentration}{K}_{i,g,t-1} + Ownershipdummies_i \\ &+ ProvinceDum_j + TimeDum_t + \alpha_i + \epsilon_{i,t} \qquad (16)\end{aligned}$$

where β_2 and β_3 are evaluated for each of the following ownership types: private, state owned, collective owned and foreign owned.

The political pecking order is expected to increase with the concentration ratio of state owned enterprises within an industry. Hence, the respective coefficient for private firms β_3 should be positive and significant. [20]

Tables 14 include here!

Table (14) plots the sensitivity of investment tt cash flow and cash flow interacted with the concentration ratio of state owned enterprises in an industry using pooled OLS and fixed effects. We obtain that β_3, the interaction term of cash flow and the concentration ratio, for private firms is significant and positive. If the concentration ratio is zero, then private firm face on average a sensitivity of investment of 0.044. This sensitivity is strictly increasing in the concentration ratio, pointing out that financial constraints increase with the concentration of State owned enterprises within an industry. Given the results in table (14), we can even conclude that private firms face particular difficulties in obtaining external financing if they compete with State owned enterprises in the same industry. Collective owned firms do not significantly distinguish themselves from private firms and have also higher external financing costs when the share of state owned firms within an industry increases. Contrary, State owned and foreign owned enterprises do not face any impact. The combined effect $\beta_2 - \beta_{2,SOE} = 0$ and $\beta_3 - \beta_{3,SOE} = 0$ is not significantly different from zero in both cases. The results confirm our prediction that the impact of the political pecking order is more severe in industries with a high share of state owned enterprises.

7 Conclusion

This paper tests the "political pecking order" of allocating credit among Chinese firms. According to Huang (2004) private firms in China face severe financial constraints, which inhibit their growth. Contrary, State Owned Enterprises and Collective Owned Enterprises are preferred beneficiary of credit. Huang (2004) argues that credit is given on the basis of political considerations rather than economic considerations. Foreign Direct Investment, by bringing in scarce capital, may ease firm financing constraints and allow private firms to growth faster.

[20] Alternatively, we calculated an Herfindahl index by taking the sum of the squares of the market shares of each state owned firm but the results obtained are similar and do not change in their interpretation.

Using a unique micro-level data-set of Chinese firms, we test these predictions by estimating financial constraints for different types of firms and assess the impact of different types of Foreign Direct Investment on Chinese firms. The results suggest that the average Chinese firm faces severe financial constraints. If we divide our sample into different types of ownership, State Owned Enterprises, Collective Owned Enterprises, Foreign Invested Enterprises and private domestic firms, we find that these constraints are significantly higher for private firms whereas all other firms face less obstacles in getting credit. Our results are robust to industry and provincial differences and a number of control variables.

To understand better the mechanism through which FDI may affect financing constraints, we separate our sample into different types of FDI. Our results indicate that FDI inflows reduced the sensitivity of investment to cash flow significantly for all types of enterprises. Focusing on the case of Joint Ventures allows us to test directly the hypothesis that private firms could overcome their financial constraints through the access to foreign capital. The results confirm this view and show direct evidence that FDI brings in scarce capital and eases financing constraints. By focusing on regional heterogeneity, our results show that firms located in coastal regions experience significant lower financing constraints and are more economically flexible. Northern provinces face the highest degree of financial constraints indicating that the political pecking order is particulary severe. In terms of industry heterogeneity, private firms competing with state owned enterprises in the same industry rely significantly higher on internal generated funds in their investment decision. Contrary, state owned firms are not financially constrained, no matter of the industry concentration ratio.

Overall, our results support the argument of Huang (2004) that the "political pecking order" favors financially inefficient State Owned Firms at the expense of private owned firms, which face financial constraints that hinder them to grow. Private firms that benefited from Foreign Direct Investment could overcome their dependency on internal financing through the access to foreign capital. In this sense, private firms were forced to form alliances with foreign investors to overcome the financial market inefficiencies caused by Chinese economic institutions and policies. We interpret this result as evidence that the growing importance of FIEs in the Chinese economy are driven not only by foreigners supply of equity capital but also by the Chinese demand for foreign equity capital.

Table 1: Overview of the ownership structure

Type of firm	Number of firms
Foreign Invested Enterprises (FIE)	**6667**
Joint Ventures (JV)	4426
Wholly Foreign Owned Enterprise (WFOE)	2054
Foreign Invested Share Holding (FISH)	187
State-Owned Enterprises (SOE)	**5791**
Private Domestic firms	**3776**
Collective Owned Enterprises (COE)	**2891**
Total	**19125**

Table 2: Summary statistics (sample means) for different ownership groups (Private Chinese firms, State Owned (SOE) Collective Owned (COE), Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH)).

	(Ownership groups)				(Foreign owned firms)		
	Private	SOE	COE	FIE	WFOE	JV	FISH
Growth of firm	0.098	0.079	0.032	0.128	0.118	0.139	0.099
	[0.004]*	[0.005]*	[0.006]*	[0.004]*	[0.005]	[0.009]*	[0.018]*
Growth of investment	0.110	0.169	0.004	0.097	0.087	0.117	0.108
	[0.139]	[0.135]	[0.027]	[0.012]	[0.016]*	[0.018]	[0.011]
Cash flow over total assets	0.221	0.176	0.158	0.131	0.142	0.113	0.102
	[0.041]*	[0.038]*	[0.005]*	[0.005]*	[0.007]*	[0.005]*	[0.007]*
Growth in Sales	0.115	0.088	0.281	0.350	0.396	0.280	0.149
	[0.069]	[0.041]	[0.032]*	[0.063]*	[0.094]	[0.038]	[0.057]
Debt ratio	0.610	0.585	0.595	0.541	0.541	0.544	0.504
	[0.003]*	[0.005]	[0.004]	[0.007]*	[0.004]	[0.022]	[0.011]*
Return on Investment	0.186	0.146	0.246	0.252	0.215	0.216	0.313
	[0.017]*	[0.039]*	[0.079]	[0.028]	[0.090]	[0.114]	[0.099]*
Total assets	799.60	3075.47	786.13	1407.72	595.11	503.76	19300.0
	[23.19]	[260.01]*	[54.54]	[201.65]*	[23.30]	[24.69]	[4357.2]*
Employment	1566	3742	1595	1871	1045	1484	16451
	[41]	[204]*	[76]	[153]*	[30]	[41]	[3269]*

Note: Standard errors are shown in brackets. We use a t-test to check whether the means are significant different from each other. We test on the 10 percent level. Significant different values are marked with an asterisk ($*$).

Table 3: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Standard OLS with robust standard errors.**

	(Investment - Change in tangible assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sales	0.046	0.182	0.182	0.174	0.181	0.181
	[0.001]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Cash flow	0.139	0.627	0.63	0.187	0.482	0.48
	[0.010]**	[0.134]**	[0.134]**	[0.021]**	[0.135]**	[0.135]**
Cash flow * FIE		-0.722			-0.556	
		[0.048]**			[0.049]**	
Cash flow * SOE		-0.737	-0.737		-0.505	-0.509
		[0.147]**	[0.147]**		[0.196]**	[0.196]**
Cash flow * COE		-0.115	-0.119		-0.443	-0.442
		[0.041]**	[0.041]**		[0.056]**	[0.056]**
Cash flow * WFOE			-1.128			-1.198
			[0.090]**			[0.090]**
Cash flow * JV			-0.658			-0.536
			[0.050]**			[0.052]**
Cash flow * FISH			0.103			0.025
			[0.344]			[0.369]
Dummy FIE		0.064			0.037	
		[0.011]**			[0.011]**	
Dummy SOE		-0.013	-0.012		-0.048	-0.048
		[0.010]	[0.010]		[0.011]**	[0.011]**
Dummy COL		0.077	0.078		0.049	0.05
		[0.013]**	[0.013]**		[0.013]**	[0.013]**
Dummy WFOE			0.103			0.098
			[0.017]**			[0.017]**
Dummy JV			0.062			0.029
			[0.012]**			[0.012]*
Dummy FISH			-0.038			-0.064
			[0.040]			[0.043]
Employment				-1.99	-1.651	-1.774
				[0.221]**	[0.220]**	[0.220]**
$Cashflow^2$				-0.004	-0.028	-0.029
				[0.001]**	[0.002]**	[0.002]**
Debt ratio				-0.162	-0.126	-0.131
				[0.009]**	[0.009]**	[0.009]**
Constant	0.084	0.027	0.028	0.113	0.114	0.118
	[0.023]**	[0.035]	[0.035]	[0.034]**	[0.035]**	[0.035]**
Observations	24527	24527	24527	23648	23648	23648
R-squared	0.05	0.23	0.23	0.23	0.25	0.26

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include provincial, industry and yearly dummies. The sample covers the period 2001 until 2005.

Table 4: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Random Effects with robust standard errors.**

	(Investment - Change in tangible assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sales	0.051	0.183	0.183	0.175	0.182	0.182
	[0.001]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Cash flow	0.142	0.621	0.624	0.189	0.478	0.475
	[0.011]**	[0.134]**	[0.134]**	[0.020]**	[0.135]**	[0.135]**
Cash flow * FIE		-0.703			-0.545	
		[0.048]**			[0.049]**	
Cash flow * SOE		-0.723	-0.723		-0.495	-0.499
		[0.137]**	[0.137]**		[0.176]**	[0.176]**
Cash flow * COE		-0.106	-0.109		-0.447	-0.449
		[0.041]**	[0.041]**		[0.056]**	[0.056]**
Cash flow * WFOE			-1.099			-1.183
			[0.090]**			[0.090]**
Cash flow * JV			-0.641			-0.426
			[0.050]**			[0.052]**
Cash flow * FISH			0.202			0.109
			[0.342]			[0.368]
Dummy FIE		0.049			0.047	
		[0.010]**			[0.010]**	
Dummy SOE		0.003	0.004		-0.039	-0.039
		[0.009]	[0.010]		[0.010]**	[0.010]**
Dummy COL		0.069	0.07		0.042	0.042
		[0.013]**	[0.013]**		[0.013]**	[0.013]**
Dummy WFOE			0.08			0.084
			[0.016]**			[0.016]**
Dummy JV			0.045			0.047
			[0.011]**			[0.014]**
Dummy FISH			-0.029			-0.061
			[0.039]			[0.043]
Employment				-2.013	-1.724	-1.842
				[0.212]**	[0.211]**	[0.212]**
$Cashflow^2$				-0.004	-0.028	-0.029
				[0.001]*	[0.002]**	[0.002]**
Debt ratio				-0.162	-0.127	-0.131
				[0.009]**	[0.009]**	[0.009]**
Constant	0.094	-0.008	-0.009	0.121	0.097	0.101
	[0.003]**	[0.007]	[0.007]	[0.007]**	[0.009]**	[0.009]**
Observations	24527	24527	24527	23648	23648	23648

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include provincial, industry and yearly dummies. The sample covers the period 2001 until 2005.

Table 5: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Fixed Effects with robust standard errors.**

	(Investment - Change in tangible assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sales	0.061	0.21	0.21	0.174	0.188	0.187
	[0.002]**	[0.004]**	[0.004]**	[0.002]**	[0.004]**	[0.004]**
Cash flow	0.262	0.818	0.818	0.187	0.479	0.482
	[0.023]**	[0.057]**	[0.057]**	[0.021]**	[0.092]**	[0.092]**
Cash flow * FIE		-1.004			-0.638	
		[0.147]**			[0.181]**	
Cash flow * SOE		-1.033	-1.035		-0.764	-0.756
		[0.149]**	[0.149]**		[0.150]**	[0.150]**
Cash flow * COE		-0.224	-0.224		-0.154	-0.152
		[0.086]**	[0.086]**		[0.047]**	[0.047]**
Cash flow * WFOE			-1.147			-0.843
			[0.161]**			[0.077]**
Cash flow * JV			-0.863			-0.614
			[0.174]**			[0.108]**
Cash flow * FISH			-0.556			-0.954
			[0.669]			[0.868]
Employment				-1.99	-69.711	-69.991
				[0.221]**	[3.378]**	[3.384]**
$Cashflow^2$				-0.004	-0.042	-0.041
				[0.001]**	[0.012]**	[0.012]**
Debt ratio				-0.162	0.007	0.007
				[0.009]**	[0.016]	[0.016]
Constant	0.084	0.053	0.053	0.113	0.552	0.555
	[0.003]**	[0.006]**	[0.006]**	[0.034]**	[0.026]**	[0.026]**
Observations	24527	24527	24527	23648	23648	23648
R-squared	0.08	0.28	0.28	0.23	0.33	0.33

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include provincial, industry and yearly dummies. The sample covers the period 2001 until 2005.

Table 6: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Standard OLS**

	(Growth of firm - Change in total assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sales	0.074	0.048	0.048	0.045	0.048	0.047
	[0.001]**	[0.001]**	[0.001]**	[0.002]**	[0.002]**	[0.002]**
Cash flow	0.16	0.297	0.299	0.169	0.241	0.241
	[0.018]**	[0.023]**	[0.023]**	[0.014]**	[0.024]**	[0.024]**
Cash flow * FIE		-0.26			-0.164	
		[0.032]**			[0.033]**	
Cash flow * SOE		-0.414	-0.416		-0.273	-0.27
		[0.033]**	[0.033]**		[0.034]**	[0.034]**
Cash flow * COE		-0.082	-0.085		-0.227	-0.231
		[0.028]**	[0.028]**		[0.038]**	[0.038]**
Cash flow * WFOE			-0.426			-0.436
			[0.061]**			[0.061]**
Cash flow * JV			-0.233			-0.112
			[0.034]**			[0.035]**
Cash flow * FISH			-0.323			-0.307
			[0.232]			[0.251]
Dummy FIE		0.037			0.019	
		[0.009]**			[0.005]**	
Dummy SOE		-0.041	-0.04		-0.063	-0.063
		[0.007]**	[0.007]**		[0.007]**	[0.007]**
Dummy COL		0.003	0.003		0.023	0.023
		[0.007]	[0.007]		[0.009]**	[0.009]**
Dummy WFOE			0.037			0.036
			[0.011]**			[0.011]**
Dummy JV			0.017			0.022
			[0.008]*			[0.008]**
Dummy FISH			-0.037			-0.053
			[0.027]			[0.029]
Employment				-1.33	-1.255	-1.315
				[0.149]**	[0.149]**	[0.149]**
$Cashflow^2$				-0.006	-0.017	-0.017
				[0.001]**	[0.001]**	[0.001]**
Debt ratio				-0.044	-0.028	-0.03
				[0.006]**	[0.006]**	[0.006]**
Constant	0.042	0.107	0.108	0.108	0.137	0.138
	[0.017]*	[0.023]**	[0.023]**	[0.023]**	[0.023]**	[0.023]**
Observations	24527	24527	24527	23648	23648	23648
R-squared	0.16	0.06	0.06	0.06	0.08	0.08

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include provincial, industry and yearly dummies. The sample covers the period 2001 until 2005.

Table 7: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Random Effects**

	(Growth of firm - Change in total assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sales	0.075	0.054	0.054	0.05	0.053	0.053
	[0.001]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Cash flow	0.16	0.286	0.287	0.169	0.22	0.219
	[0.018]**	[0.024]**	[0.024]**	[0.014]**	[0.024]**	[0.024]**
Cash flow * FIE		-0.269			-0.182	
		[0.034]**			[0.035]**	
Cash flow * SOE		-0.421	-0.422		-0.275	-0.272
		[0.036]**	[0.036]**		[0.037]**	[0.037]**
Cash flow * COE		-0.066	-0.068		-0.236	-0.241
		[0.028]*	[0.028]*		[0.039]**	[0.039]**
Cash flow * WFOE			-0.467			-0.481
			[0.064]**			[0.064]**
Cash flow * JV			-0.229			-0.116
			[0.037]**			[0.038]**
Cash flow * FISH			-0.301			-0.255
			[0.262]			[0.282]
Dummy FIE		0.03			0.061	
		[0.010]**			[0.008]**	
Dummy SOE		-0.038	-0.038		0.016	0.016
		[0.008]**	[0.008]**		[0.010]	[0.010]
Dummy COL		-0.009	-0.009		-0.018	-0.018
		[0.008]	[0.008]		[0.008]*	[0.008]**
Dummy WFOE			0.023			0.027
			[0.011]*			[0.012]*
Dummy JV			0.021			0.033
			[0.009]*			[0.009]**
Dummy FISH			-0.034			-0.051
			[0.033]			[0.035]
Employment				-1.333	-1.28	-1.345
				[0.150]**	[0.151]**	[0.152]**
$Cashflow^2$				-0.006	-0.016	-0.016
				[0.001]**	[0.001]**	[0.001]**
Debt ratio				-0.045	-0.034	-0.036
				[0.006]**	[0.006]**	[0.006]**
Constant	0.036	0.106	0.106	0.13	0.145	0.147
	[0.002]**	[0.005]**	[0.005]**	[0.005]**	[0.007]**	[0.007]**
Observations	24527	24527	24527	23648	23648	23648

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include provincial, industry and yearly dummies. The sample covers the period 2001 until 2005.

Table 8: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), Wholly Foreign Owned Enterprises (WFOE), Joint Ventures(JV), Foreign Investment Share Holdings (FISH), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Fixed Effects**

	(Growth of firm - Change in total assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sales	0.104	0.063	0.063	0.045	0.05	0.05
	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Cash flow	0.241	0.452	0.453	0.169	0.29	0.292
	[0.021]**	[0.033]**	[0.033]**	[0.014]**	[0.053]**	[0.054]**
Cash flow * FIE		-0.673			-0.562	
		[0.086]**			[0.105]**	
Cash flow * SOE		-0.554	-0.557		-0.427	-0.431
		[0.086]**	[0.086]**		[0.114]**	[0.114]**
Cash flow * COE		-0.193	-0.189		-0.191	-0.19
		[0.050]**	[0.050]**		[0.056]**	[0.056]**
Cash flow * WFOE			-0.675			-0.678
			[0.153]**			[0.161]**
Cash flow * JV			-0.506			-0.501
			[0.082]**			[0.101]**
Cash flow * FISH			-0.498			-0.78
			[0.450]			[0.563]
Employment				-1.33	-40.656	-40.74
				[0.149]**	[1.965]**	[1.969]**
$Cashflow^2$				-0.006	0.003	0.003
				[0.001]**	[0.007]	[0.007]
Debt ratio				-0.044	-0.015	-0.015
				[0.006]**	[0.010]	[0.010]
Constant	0.038	0.124	0.123	0.108	0.427	0.427
	[0.003]**	[0.004]**	[0.004]**	[0.023]**	[0.015]**	[0.015]**
Observations	24527	24527	24527	23648	23648	23648
R-squared	0.23	0.12	0.12	0.06	0.16	0.16

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include provincial, industry and yearly dummies. The sample covers the period 2001 until 2005.

Table 9: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE) , State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Arellano Bond (1992)** to correct for the endogeneity of the Cash flow.

	(Investment - Change in tangible assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Investment (t-1)	-0.116	-0.062	-0.062	-0.093	-0.06	-0.062
	[0.020]**	[0.018]**	[0.018]**	[0.015]**	[0.017]**	[0.017]**
Sales	0.146	0.149	0.145	0.137	0.146	0.146
	[0.080]	[0.084]	[0.084]	[0.071]	[0.077]	[0.077]
Cash flow	0.524	0.846	0.849	0.127	0.415	0.409
	[0.199]**	[0.149]**	[0.151]**	[0.013]**	[0.169]*	[0.167]*
Cash flow * FIE		-1.388			-0.921	
		[0.439]**			[0.412]*	
Cash flow * SOE		-1.578	-1.576		-0.617	-0.61
		[0.368]**	[0.369]**		[0.110]**	[0.108]**
Cash flow * COE		0.044	0.049		0.132	0.154
		[0.414]	[0.420]		[0.570]	[0.574]
Cash flow * WFOE			-0.934			-0.521
			[0.281]**			[0.236]*
Cash flow * JV			-1.409			-0.978
			[0.446]**			[0.401]*
Cash flow * FISH			0.152			-0.561
			[3.330]			[3.719]
Employment				-63.565	-62.2	-61.122
				[16.438]**	[15.825]**	[15.175]**
$Cashflow^2$				-0.117	-0.066	-0.067
				[0.042]**	[0.023]**	[0.022]**
Debt ratio				0.084	0.02	0.021
				[0.086]	[0.057]	[0.057]
Sales (t-1)	0.194	0.528	0.52	0.114	0.214	0.2
	[0.121]	[0.236]*	[0.237]*	[0.146]	[0.215]	[0.216]
Cash flow (t-1)	-0.081	-0.134	-0.137	-0.086	-0.127	-0.127
	[0.070]	[0.077]	[0.077]	[0.067]	[0.072]	[0.072]
Cash flow * FIE (t-1)		0.5			0.771	
		[0.460]			[0.387]*	
Cash flow * SOE (t-1)		-0.272	-0.25		0.006	0.045
		[0.485]	[0.490]		[0.658]	[0.660]
Cash flow * COE (t-1)		0.278	0.294		0.549	0.566
		[0.282]	[0.283]		[0.300]	[0.301]
Cash flow * WFOE (t-1)			1.709			1.394
			[1.440]			[0.899]
Cash flow * JV (t-1)			0.174			0.651
			[0.334]			[0.336]
Cash flow * FISH (t-1)			-0.792			-0.902
			[1.396]			[1.626]
Constant	-0.011	0.001	0.001	-0.035	-0.019	-0.018
	[0.008]	[0.009]	[0.010]	[0.010]**	[0.011]	[0.011]
Observations	7726	7726	7726	7549	7549	7549
Sargan test	14.46	8.98	8.96	21.07	7.48	7.46
$chi^2(6)$	0.03	0.17	0.17	0.002	0.32	0.32
1st order auto	-1.29	-1.26	-1.27	-1.31	-1.30	-1.30
	0.196	0.207	0.205	0.281	0.282	0.194
2nd order auto	-1.14	-0.98	-0.96	-1.09	-1.12	-1.09
	0.254	0.328	0.336	0.278	0.278	0.277
year dummies	yes	yes	yes	yes	yes	yes
Ftest(6,7712)	141	113	93	86	85	73

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include yearly dummies. The sample covers the period 2001 until 2005.

Table 10: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different ownership groups (Foreign Invested Enterprises (FIE), State Owned (SOE) and Collective Owned (COE)) in respect to the reference group (private domestic firm). Results are obtained using **Arellano Bond (1992)** to correct for the endogeneity of the Cash flow.

	(Growth of firm - Change in total assets)					
	(1)	(2)	(3)	(4)	(5)	(6)
Investment (t-1)	-0.059	-0.064	-0.065	-0.061	-0.068	-0.068
	[0.012]**	[0.017]**	[0.017]**	[0.012]**	[0.019]**	[0.019]**
Sales	0.023	0.033	0.031	0.021	0.03	0.029
	[0.034]	[0.034]	[0.034]	[0.033]	[0.033]	[0.033]
Cash flow	0.245	0.413	0.41	0.189	0.017	0.007
	[0.031]**	[0.137]**	[0.138]**	[0.147]	[0.096]	[0.094]
Cash flow * FIE		-0.265			-0.131	
		[0.054]**			[0.165]	
Cash flow * SOE		-0.137	-0.129		0.302	0.32
		[0.057]*	[0.057]*		[0.447]	[0.445]
Cash flow * COE		-0.38	-0.377		0.131	0.15
		[0.208]	[0.203]		[0.212]	[0.210]
Cash flow * WFOE			-0.101			0.222
			[0.039]**			[0.319]
Cash flow * JV			-0.236			-0.124
			[0.061]**			[0.178]
Cash flow * FISH			-1.52			-1.451
			[1.002]			[1.135]
Employment				-21.577	-19.591	-19.044
				[8.446]*	[8.094]*	[7.702]*
$Cashflow^2$				-0.018	-0.017	-0.019
				[0.028]	[0.017]	[0.017]
Debt ratio				0.081	0.033	0.034
				[0.066]	[0.042]	[0.042]
Sales (t-1)	0.388	0.145	0.144	0.348	0.08	0.076
	[0.139]**	[0.060]*	[0.061]*	[0.142]*	[0.074]	[0.074]
Cash flow (t-1)	-0.076	-0.077	-0.078	-0.077	-0.074	-0.075
	[0.029]**	[0.030]*	[0.030]*	[0.029]**	[0.030]*	[0.030]*
Cash flow * FIE (t-1)		0.161			0.225	
		[0.166]			[0.172]	
Cash flow * SOE (t-1)		0.409	0.402		0.363	0.382
		[0.446]	[0.443]		[0.513]	[0.512]
Cash flow * COE (t-1)		0.28	0.287		0.319	0.332
		[0.125]*	[0.125]*		[0.130]*	[0.130]*
Cash flow * WFOE (t-1)			0.774			0.67
			[0.599]			[0.405]
Cash flow * JV (t-1)			0.041			0.159
			[0.099]			[0.155]
Cash flow * FISH (t-1)			-0.703			-0.731
			[0.454]			[0.570]
Constant	0.001	-0.001	0	-0.009	-0.007	-0.007
	[0.002]	[0.004]	[0.004]	[0.005]*	[0.006]	[0.006]
Observations	7732	7732	7732	7555	7555	7555
Number of id	5988	5988	5988	5967	5967	5967
Sargan	15.37	9.49	9.56	11.37	9.97	6.93
$chi^2(6)$	0.02	0.17	0.17	0.09	0.17	0.42
1st order auto	-1.07	-1.08	-1.08	-1.07	-1.09	-1.08
	0.284	0.281	0.282	0.284	0.277	0.278
2nd order auto	-1.09	-1.09	-1.09	-1.10	-1.12	-1.12
	0.239	0.278	0.278	0.271	0.261	0.263
year dummies	yes	yes	yes	yes	yes	yes
Ftest(6,7712)	131	105	89	84	81	69

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include yearly dummies. The sample covers the period 2001 until 2005.

Table 11: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different regional blocks (Costal, North, West) in respect to the reference group (Central regions).

	(**Investment**)				(**Growth of firm**)			
	(OLS)	(FE)	(OLS)	(FE)	(OLS)	(FE)	(OLS)	(FE)
Sales	0.176	0.207	0.177	0.186	0.075	0.104	0.076	0.098
	[0.002]**	[0.004]**	[0.002]**	[0.004]**	[0.001]**	[0.002]**	[0.001]**	[0.002]**
Cash flow	0.554	0.869	0.449	0.153	0.053	0.159	0.029	0.048
	[0.045]**	[0.066]**	[0.046]**	[0.064]**	[0.023]*	[0.035]**	[0.009]**	[0.017]**
Cash flow * Coast	-0.715	-1.283	-0.77	-0.514	-0.135	-0.42	-0.117	-0.223
	[0.047]**	[0.088]**	[0.052]**	[0.119]**	[0.024]**	[0.047]**	[0.045]**	[0.027]**
Cash flow * West	-0.217	-0.422	-0.318	0.277	0.007	-0.074	-0.052	-0.029
	[0.200]	[0.242]	[0.402]	[0.278]	[0.050]	[0.129]	[0.052]	[0.151]
Cash flow * North	0.141	0.036	0.217	0.306	-0.002	-0.022	-0.018	0.003
	[0.057]**	[0.012]**	[0.078]**	[0.137]*	[0.039]	[0.065]	[0.039]	[0.075]
Dummy Coast	0.054		0.062		0		0.008	
	[0.011]**		[0.012]**		[0.006]		[0.006]	
Dummy North	0.003		-0.002		-0.007		-0.008	
	[0.016]		[0.017]		[0.008]		[0.009]	
Dummy West	-0.006		-0.009		-0.007		-0.008	
	[0.015]		[0.016]		[0.008]		[0.008]	
Employment			-1.882	-71.169			-0.34	-19.592
			[0.217]**	[3.405]**			[0.110]**	[1.851]**
$Cashflow^2$			0.01	-0.081			0.009	0.003
			[0.002]**	[0.011]**			[0.001]**	[0.006]
Debt level			-0.166	-0.001			-0.074	0.024
			[0.009]**	[0.017]			[0.004]**	[0.009]**
Constant	-0.009	0.041	0.093	0.518	0.034	0.064	0.091	0.113
	[0.023]	[0.024]	[0.022]**	[0.465]	[0.011]**	[0.013]**	[0.011]**	[0.253]
Observations	24527	24527	23648	23648	24527	24527	23648	23648
R-squared	0.22	0.27	0.24	0.32	0.16	0.24	0.17	0.25

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include ownership, yearly and industry dummies. The sample covers the period 2001 until 2005.

Table 12: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow for different regional blocks (Costal, North, West) in respect to the reference group (Central regions). Results are obtained using **Arellano Bond (1992)** to correct for the endogeneity of the Cash flow.

	(**Investment**)		(**Growth of firm**)	
	(1)	(2)	(3)	(4)
Growth of firm (t-1)	-0.051	-0.05	-0.018	-0.016
	[0.033]	[0.033]	[0.032]	[0.033]
Δ Sales	1.244	1.3	0.706	0.737
	[0.059]**	[0.062]**	[0.039]**	[0.041]**
Cash flow	0.854	0.919	0.333	0.283
	[0.095]**	[0.233]**	[0.062]**	[0.083]**
Cash flow * Coast	-2.453	-2.499	-1.747	-1.902
	[0.164]**	[0.210]**	[0.108]**	[0.140]**
Cash flow * West	1.398	1.536	0.467	0.619
	[0.419]**	[0.483]**	[0.175]**	[0.217]**
Cash flow * North	-0.087	-0.181	-0.149	-0.327
	[0.332]	[0.367]	[0.218]	[0.241]
Employment		-15.141		1.931
		[17.028]		[11.221]
$Cashflow^2$		0		0
		[0.000]		[0.000]
Debt ratio		0.016		0.035
		[0.030]		[0.020]
Δ Sales (t-1)	0.209	0.217	0.121	0.128
	[0.074]**	[0.077]**	[0.046]**	[0.048]**
Cash flow (t-1)	0.199	0.198	0.151	0.163
	[0.091]*	[0.093]*	[0.072]*	[0.070]*
Cash flow * Coast (t-1)	-2.528	-2.546	-1.604	-1.738
	[0.232]**	[0.246]**	[0.154]**	[0.163]**
Cash flow * West (t-1)	-0.28	-0.179	-0.034	-0.07
	[0.680]	[0.718]	[0.445]	[0.471]
Cash flow * North (t-1)	-0.218	-0.323	-0.021	-0.265
	[0.379]	[0.421]	[0.249]	[0.276]
Observations	2445	2310	2445	2310
Number of id	971	956	971	956

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include ownership and yearly dummies. The sample covers the period 2001 until 2005.

Table 13: Overview of the ownership structure per province

Province	Province-group	Private	SOE	COE	FIE	JV	WFOE	FISH
ANHUI	central	82	111	52	50	37	6	7
CHONGQING	central	112	125	47	39	35	2	2
HEBEI	central	2	2	1	0	0	0	0
HENAN	central	103	260	172	40	34	4	2
HUBEI	central	101	240	115	56	44	9	3
HUNAN	central	63	132	43	31	20	5	6
JIANGXI	central	26	85	26	18	10	6	2
SHAANXI	central	61	254	59	37	34	2	1
SHANXI	central	3	12	11	4	2	1	1
FUJIAN	coast	127	181	55	521	250	264	7
GUANGDONG	coast	525	711	268	2,382	1190	1155	37
GUANGXI	coast	75	148	68	60	53	5	2
JIANGSU	coast	485	502	360	745	525	196	24
SHANDONG	coast	324	627	549	555	489	45	21
SHANGHAI	coast	177	351	94	744	587	136	21
TIANJIN	coast	67	151	85	248	195	50	3
ZHEJIANG	coast	664	348	242	490	392	87	11
BEIJING	north	58	188	47	178	134	24	20
HEILONGJIANG	north	43	115	49	28	23	3	2
INNERMONGOLIA	north	11	22	11	6	5	0	1
JILIN	north	37	114	52	42	38	3	1
LIAONING	north	129	228	101	193	154	35	4
GANSU	west	21	102	33	14	14	0	0
GUIZHOU	west	48	155	32	17	16	1	0
HAINAN	west	15	44	4	8	5	2	1
NINGXIA	west	25	31	10	8	6	1	1
QINGHAI	west	12	19	13	1	1	0	0
SICHUAN	west	268	312	190	90	82	4	4
TIBET	west	2	10	2	0	0	0	0
XINJIANG	west	17	46	12	7	3	3	1
YUNNAN	west	94	165	88	55	48	5	2

Table 14: Regression of firm performance on the change of the sales to reflect investment demand, cash flow $(CF/K)_t$ and the cash flow accounting for the share of SOE in an industry.

	(**Investment**)			
	(OLS)	(OLS)	(FE)	(FE)
Sales	0.128	0.128	0.061	0.061
	[0.010]**	[0.010]**	[0.013]**	[0.013]**
Cash flow	0.044	0.042	0.198	0.199
	[0.015]**	[0.015]**	[0.091]*	[0.091]*
Cash flow * Share	0.89	0.888	0.514	0.542
	[0.127]**	[0.127]**	[0.186]**	[0.186]**
Cash flow * FIE	-0.058		-0.553	
	[0.012]**		[0.193]**	
Cash flow * FIE * Share	-0.212		-0.493	
	[0.049]**		[0.085]**	
Cash flow * SOE	-0.159	-0.159	-0.208	-0.208
	[0.084]*	[0.084]*	[0.052]**	[0.052]**
Cash flow * SOE * Share	-0.812	-0.828	-0.628	-0.626
	[0.238]**	[0.238]**	[0.262]**	[0.262]**
Cash flow * COE	-0.233	-0.231	-0.182	-0.206
	[0.080]**	[0.080]**	[0.288]	[0.288]
Cash flow * COE * Share	0.035	0.031	1.371	1.358
	[0.376]	[0.376]	[1.551]	[1.548]
Cash flow * WFOE		-0.295		-0.407
		[0.105]*		[0.242]*
Cash flow * WFOE * Share		-0.361		-0.418
		[0.129]*		[0.171]*
Cash flow * JV		-0.104		-0.266
		[0.048]*		[0.109]*
Cash flow * JV * Share		0.291		0.663
		[0.295]		[1.079]
Cash flow * FISH		0.254		-0.332
		[0.326]		[0.798]
Cash flow * FISH * Share		-0.318		0.032
		[0.915]		[2.704]
Employment	-1.634	-1.639	-1.838	-1.879
	[0.140]**	[0.140]**	[0.456]**	[0.453]**
Observations	23648	23648	23648	23648
R-squared	0.05	0.05	0.18	0.19

Note: We test on the 1 and 5 percent level and reject the null hypothesis if the t-statistic is bigger than 2.576 on the 1 and 1.960 on the 5 level. We indicate the level of significance with stars whereas the 5 percent level is represented with one star (*) and the 1 percent level with two (**). Standard errors are shown in brackets. All regressions include ownership and yearly dummies. The sample covers the period 2001 until 2005.

References

Aghion, P., G. M. Angeletos, A. Banerjee, and K. Manova (2005): "Volatility and Growth: Credit Constraints and Productivity-Enhancing Investment," *NBER Working Papers*, 11349.

Allen, F., J. Qian, and M. Qian (2005): "Law, Finance and Economic Growth in China," *Journal of Financial Economic*, 77, pp. 57–116.

Almeida, H., and M. Campello (2006): "Financial Constraints, Asset Tangibility and Corporate Investment," *NBER Working Papers*, 12087.

Anderson, R., and C. Kegels (1997): "Finance and Investment in Transition: Czech Enterprises, 1993-1994," *The Davidson Institute Working Paper Series*.

Arellano, M., and S. Bond (1992): "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations.," *Review of Economic Studies*, 58, 277–297.

Asian-Development-Bank (2003): *People's Republic of China: The Development of Private Enterprise*. Asian Development Bank.

Ayyagari, M., A. Demirg-Kunt, and V. Maksimovic (2007): "Formal versus Informal Finance: Evidence from China," *World Bank*.

Beck, T., A. Demirguc-Kunt, and V. Maksimovic (2005): "Financial and Legal Constraints to Growth: Does Firm Size Matter?," *Journal of Finance*, 60(1), 137–177.

Blundell, R., and S. Bond (1998): "Initial conditions and moment restrictions in dynamic panel data models," *Jounrnal of Econometrics*, 87(1), 115–143.

Blundell, R., S. Bond, M. Devereux, and F. Schiantarelli (1992): "Investment and Tobin's Q: Evidence from Panel Data," *Journal of Econometrics*, 51, 233–257.

Bond, S., A. J. Elston, J. Mairesse, and B. Mulkay (2003): "Financial Factors and Investment in Belgium, France, Germany and the United Kingdom," *The Review of Economics and Statistics*, 85(1), pp. 153–165.

Bond, S., and C. Meghir (1994): "Dynamic Investment Models and the Firm's Financing Policy," *Review of Economic Studies*, 61(2), 197–222.

Boyreau-Debray, G. (2003): "Financial Intermediation and Growth: Chinese style," *World Bank Policy Research Working Paper*, 3027.

Budina, N., H. Garretsen, and E. de Jong (2000): "Liquidity Constraints and Investment in Transition Economies - The Case of Bulgaria," *Economics of Transition*, 8, pp. 453475.

Carpenter, R. E., and B. Petersen (2002): "Is growth of small firms constrained by internal finance?," *The Review of Economics and Statistics*, 84(2), pp. 298–309.

Cheng, X., and H. Degryse (2005): "The Impact of Bank and Non-Bank Financial Institutions on Local Economic Growth in China," *mimeo, University of Leuven*.

Dollar, D., and S. Wei (2007): "Das (wasted) Kapital: Firm Ownership and Investment Efficiency in China," *NBER Working Paper*, 13103.

Dougherty, S., and R. Herd (2005): "Fast-Falling Barriers and Growing Concentration: The Emergence of a Private Economy in China,," *OECD Economics Department Working Papers*, 471, OECD Economics Department.

Fazzari, S., G. Hubbard, and B. Petersen (1988a): "Financing constraints and corporate Investment," *Brookings papers on Economic Activity*, 19, pp. 141–195.

——— (1988b): "Investment, financing decisions and tax policy," *American Economic Review*, 78, pp. 200–219.

——— (2000): "Investment cash flow sensitivities are useful: a comment," *Quarterly Journal of Economics*, 115(2), pp. 695–712.

Gilchrist, S., and C. P. Himmelberg (1998): "Investment, Fundamentals and Finance," *NBER Macro Annual 1998*, pp. 223–274.

Gregory, N., S. Tenev, and D. Wagle (2000): *Chinas Emerging Private Enterprises: Prospects For The New Century*. International Finance Corporation.

Griliches, Z., and J. Hausmann (1986): "Errors in Variables in Panel Data," *Journal of Econometrics*, 31, pp. 93–118.

Harrison, A., I. Love, and M. McMillian (2004): "Global capital flows and financing constraints," *Journal of Development Economics*, 75, pp. 269–301.

Harrison, A., and M. McMillian (2003): "Does direct foreign investment affect domestic firm credit constraints?," *Journal of International Economics*, 61(1), 73–100.

Hericourt, J., and S. Poncet (2007): "FDI and Credit Constraints: Firm-level evidence from China," *Working Paper Paris 1*.

Huang, Y. (2004): *Selling China*. Cambridge University Press.

Hubbard, G., and A. K. Kashyap (1995): "Internal finance and firm investment," *Journal of Money, Credit & Banking*, 27, 1–28.

Hubbard, R. G. (1998): "Capital Market Imperfections and Investment," *Journal of Economic Literature*, 36(1), pp. 193–225.

Hutchinson, J., and A. Xavier (2004): "Comparing the Impact of Credit Constraints on the Growth of SMEs in a TRansition Country with an Established Market Economy," *LICOS Discussion paper*, 150.

Huyghebaert, N., Q. Quan, and L. Sun (2006): "Financing Decisions in Newly Privatized Chinese Firms: Does a Stock Market Quotation Really Provide Disciplining," *KUL Working paper*.

Keister, L., and J. Lu (2001): "The Transformation Continues: The Status of Chinese StateOwned Enterprises," *National Bureau of Asian Research Analysis*.

Konings, J., M. Rizov, and H. Vandenbussche (2003): "Investment Constraints in Transition Countries," *Economic Letters*, 78(2), pp. 253–258.

Konings, J., and H. Vandenbussche (2004): "The adjustment of Financial Ratios in the presence of Soft Budget Constraints: evidence from Bulgaria," *European Accounting Review*, 1.

Li, K., and T. Liu (2001): "The Impact of Liberalization of Financial Resources in China's Economic Growth: Evidence from Provinces," *Journal of Asian Economics*, 12, pp. 245–262.

Lizal, L., and J. Svejnar (2002): "Investment, Credit rationing and the soft budget constraint: Evidence from Czech panel data," *The Review of Economics and Statistics*, 84(2), pp. 353–370.

Love, I. (2003): "Financial development and financing constraints: international evidence from the structural investment model," *Review of Financial Studies*, 16, pp. 765–791.

Modigliani, F., and M. H. Miller (1958): "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review*, 48, 261–97.

Naughton, B. (2007): *The Chinese Economy: Transition and Growth*. MIT Press.

Nijman, T., and M. Verbeek (1992): "Testing for selectivity in panel data models," *International Economic Review*, 33(3), pp. 681–703.

Quan, Q., and N. Huyghebaert (2005): "Share issuing privatizations in China: Determinants of public share allocation and underpricing," *LICOS Discussion Papers*, 16205.

Stiglitz, J., and A. Weiss (1981): "Credit Rationing in markets with imperfect information," *American Economic Review*, 71, 393–410.

Wooldridge, J. M. (2002): *Econometric Analysis of Cross Section and Panel Data*. The MIT Press, Cambridge, MA.

Xu, M. (2005): "Resolution of Non-Performing Loans in China," *Glucksman Institute for Research in Security Market, NYU*.

8 Appendix: Measuring the Marginal Product of Capital with respect to future profits

After having obtained the Euler equation (6), we have to identify each term. First, we compute the marginal product of capital (MPK) by assuming the following profit function:

$$D_t(K_t, L_t\xi_t) = \Pi(K_t, L_t, \xi_t) - C(K_t, I_t) - I_t - wL \tag{17}$$

$$\begin{gathered}\text{s.t } \Pi(K, L, F) = P(Y)Y \\ \text{and } Y = AK_K^{\alpha}L_L^{\alpha}.\end{gathered}$$

where K defines the capital stock, w the factor price of labor, L labor input, F fixed cost of production and Y the output produced by the firm. In order to derive the derivative of future profits with respect to capital, we derive the dividend pay out function with the respect to labor.

$$\frac{\partial D}{\partial L} = \frac{\partial \Pi(K_t, L_t, \xi_t)}{\partial L} - w = 0 \tag{18}$$

$$\frac{\partial \Pi(K_t, L_t, \xi_t)}{\partial L} = \frac{\partial P(Y_t)}{\partial Y}\frac{\partial Y_t}{\partial L}Y_t + P(Y_t)\frac{\partial Y}{\partial L} = 0 \tag{19}$$

We substitute this result into the equation above and get the marginal product of labor:

$$\frac{\partial Y}{\partial L} = \frac{w}{P}\left[1 + \frac{1}{\eta}\right]^{-1} \tag{20}$$

where the price elasticity of output η is defined as $\partial Y/\partial P P/Y$. In order to get the marginal product of capital we use the fact that our production function is homogenous of degree 1, so we can write:

$$Y(K_t, L_t) = \frac{\partial Y}{\partial L}L + \frac{\partial Y}{\partial K}K \tag{21}$$

Therefore we get:

$$\frac{\partial Y}{\partial K} = \frac{Y(K_t, L_t)}{K} - \frac{\partial Y}{\partial L}\frac{L}{K} \tag{22}$$

and substituting:

$$\frac{\partial Y}{\partial K} = \frac{Y}{K} - \frac{w}{P}\left[1 + \frac{1}{\eta}\right]^{-1}\frac{L}{K} \tag{23}$$

To get now the marginal product of capital with respect to future profits, $\frac{\Pi}{K}$, we derive the profit function:

$$\frac{\partial \Pi}{\partial K} = \frac{Y}{K}P\left[1 + \frac{\partial 1}{\partial \eta}\right] \tag{24}$$

$$\frac{\partial \Pi}{\partial K} = \left[\frac{Y}{K} - \frac{w}{P}\left(1 + \frac{1}{\eta}\right)^{-1}\frac{L}{K}\right]\left[1 + \frac{1}{\eta}\right]P \tag{25}$$

$$\frac{\partial \Pi}{\partial K} = \left[1 + \frac{1}{\eta}\right] \frac{PY}{K} - w\frac{L}{K} \tag{26}$$

Next we follow Love (2003) and use the sales-based measure because it is less correlated with cash flow than the alternative operating profits measure. See Gilchrist and Himmelberg (1998) for derivation of the sales-based MPK measure and the arguments against using the operating profits measure of MPK. Unfortunately we do not have direct measures for the markup η at the firm level, however we rely on the fixed effects to capture these important firm-dependent characteristics. In addition we take the average of the sales to capital ratio at the 2−digit NAICS2002 level industry level for each ownership class to further decrease the potential correlation between future sales growth and cash flow.