Financing Source and Firm Growth in a Hybrid Financial System: Evidence from China

Jun Du
Aston Business School,
Aston University
Birmingham B4 7ET
United Kingdom

Email: j.du@aston.ac.uk

and

Sourafel Girma
Nottingham University Business School
Jubilee Campus, Wollaton Road
Nottingham, NG8 1BB
United Kingdom

Email: Sourafel.Girma @nottingham.ac.uk

Abstract

Using a comprehensive firm-level dataset spanning the period 1998-2005, this paper depicts a detailed picture of China's financial sectors and industrial firms' financing pattern, and provides a thorough investigation of the relationship between financing source and firm growth. We take into account firm surviving selectivity and reverse causality of firm financing source into account, and find that financing source matters for firm growth in China, although this does not tell the whole story. The relative importance of the different financing sources depends on firm ownership and growth channel. We find strong complementarities between formal financing channels and informal ones, and between domestic finance and foreign investment in promoting firm's growth.

JEJ Classification: O5 G21 G28

Keywords: China, financing source, growth

This version: August 2008

1. Introduction

The co-existence of a formal financial sector and an informal financial sector in many developing countries, commonly known as financial dualism, is neither a new phenomenon in practice, nor new knowledge in the literature. According to the OECD's estimates, the extent of informal financial during 1970s and 1980s is enormous: the volume of mobilized savings equal to 10% of the total GDP in Ethiopia, 83% of the agricultural loans and 93% urban business capital in Indonesia, and 30% of the total urban credit issued in India (Germidies, Kessler and Meghir, 1991). China, as in many other cross-country studies, has been missed out from the comparison. In fact, little is known about whether and how informal financial sector works, and how much economic activity it supports in China (Cull, Xu and Zhu, 2007). In the recently heated debates on China's finance and growth puzzle, this has become a particularly highlighted issue.

While the finance and growth literature has consistently established the belief that a healthy financial system is necessary for a country to maintain economic growth (see Levine, 2005 for a comprehensive survey), China emerges as a counter example. The Chinese economy has maintained an unprecedented economic growth for the last thirty years, despite of its financial systems generally being regarded underdeveloped even by developing nations' standards (standard Boyreay-Debray, 2005; Allen et al 2005). How did this happen? What role does China's financial system play in the economy? Is China really a counter example?

The "China's finance-growth puzzle" could have two explanations. One could be that the theoretical prediction about finance and growth relationship will apply for China; it just has not applied yet; the other could be that the theory does not apply for China at all. Should the actual explanation lie in the second scenario, in which a

deficient financial system can become a hurdle of the economic growth, it would send an obviously worrying signal to China about its economic sustainability. Some stylized facts provide support to this scenario. China has maintained high growth in spite of the problems in its financial system in part because of the continuous investment and infrastructure spending. China's global trade surplus has increased steadily over more than a decade, which by 2006 made China the world's largest current account surplus country (Lardy, 2006). Meanwhile, with over 40% saving rate that is among the highest in the world, pouring into the financial sectors which are dominated by state-owned commercial banks, funds are not the scarcest resource for the economy. It is likely that given the excessive available funds, its usage may not be as efficient as it would be in an investment-starved condition. It is unlikely, however, that this situation can be sustained indefinitely, considering that the projected savings shows a declining trend as a response to the government policy (Kuijs, 2005), and that the global trade environment is constantly changing. In such a case, it would be a matter of time before the finance-growth theory works effectively on China – its underdeveloped financial arrangements would finally be impediments to the economic growth. Then improving financial resource allocation efficiency at the earliest stage would be most critical for a sustainable economy.

If however, the true explanation lies in the first scenario, according to which the current finance-growth theory does not apply to China, then discovering why the theory does not apply will add to the existing literature with an undismissible case study in the world economy. Recent empirical studies raise some albeit conflicting arguments on the topic. On the one hand, Allen, Qian and Qian (2005), hereafter AQQ, find that the key driver of China's economic growth has been the private sector, while informal finance and governance mechanisms have been more important and more efficient than the formal financial system in supporting its growth (also see Liu

and Li, 2001). On the other hand, there is evidence that the performance of Chinese private enterprises is associated with the access to formal bank loans (Cull and Xu, 2005), and firms using formal financing sources grow faster than those financed by alternative channels (Cheng and Degryse 2007; Maksimovic et al 2008). With the apparent disputes, it is difficult to draw a conclusion on the role of the Chinese financial system that appears to be a mixture of formal and informal financial institutions and agents. We analyze the possible reasons of the conflicting evidence found in previous studies in our paper. Further investigations are therefore warranted to uncover the mechanism of the finance and economic growth relationship, importantly based on adequate micro-level evidence (also see Cheng and Degryse, 2007).

Our paper aspires to fill in this gap by providing a systematic analysis of the relationship between financing sources and firm growth in China using the most comprehensive and up-to-date firm-level dataset available. Based on a detailed profile of the financing channels available firms in China both in formal financial sector and in informal ones, we consider four major types of financing channels for Chinese industrial enterprises: the commonly considered channels in the previous studies, namely (1) formal financing source through domestic bank loans, and (2) self-raised finance through informal financing sources, as well as from (3) state budget and (4) foreign investors that existing studies tend to ignore from their analyses. In particular, we seek to answer the following two questions: (i) Does the source of finance matter for firm growth at all? (ii) If so, among firms' financing sources, which is the most important for firm growth in China and under what circumstances?

By answering these questions, we expect to improve our understanding of the role of each financing channel in supporting industrial enterprises' growth performance in China. The findings will also shed some light on the debate around the

performance of China's financial system. If there is robust evidence that informal financing channels consistently outperform formal financing channel, it would indicate financial resource misallocation, considering that formal financial intermediaries that control at least 70% of the financial capital only serve less than 30% of manufacturing firms[i]. If, on the other hand, there is evidence that these financing channels are complementary in serving economic growth, then it may encourage us to rethink about China's financial system as an unconventional mix of formal and informal financial institutions and agents. Either way, the findings will provide useful insights to China's finance-growth puzzle, and useful lessons to other developing and transition economies in which the principal financial institutions are state-owned and the private sector starts to dominate the economic landscape. Last, but certainly not the least, the findings will also present some implications on China's current reform towards maximizing the economic growth potential.

Accounting for sample selectivity and potential endogeneity of finance variables, we find robust evidence that the source of finance indeed matters to firm growth. However the relationship between financing sources and firm growth differs across the type of firm ownership and growth channel, namely TFP growth and employment growth. We also find strong complementarities between formal financing channels and informal ones, and between domestic finance and foreign investment in promoting firm's growth.

The paper is organized as follows. Section 2 reviews the theoretical arguments as to why financing sources should matter to growth and review the recent debates on China's finance and growth puzzle. Section 3 describes China's current financial sectors and the financing patterns of Chinese firms. Section 4 presents the empirical model and discuss some econometric issues that arise. Sector 4 describes the data

while Section 5 discusses the empirical findings of the paper. Finally, Section 6 concludes.

2. The Literature

2.1 Why should financing source matter?

The theoretical literature provides us limited guidance as to why should financing sources make any difference. The mainstream theories and evidence in the finance and growth literature are developed with the default focus on formal financial system development, which in fact makes sense in most developed economies where the formal financial system dominates. For many developing economies in which informal financial institutions may be just as important or even more so, the existing theories on informal financial system and its role in the economy are largely limited to Stiglitz (1990) and Arott and Stigltz (1990). Set in the context of credit market and insurance market, they build up models to evaluate the effects of peer monitoring systems of informal (or "non-market" as used by the authors) lenders and insurers. The authors demonstrate that given the right incentives, informal lenders and insurers may stand in a superior position than their formal counterparts to address the insufficient informational problems and generate improved welfare for the borrowers and the insured.

Opposite arguments contend that informal financial arrangements only play a complementary role to formal financial systems by serving the low end of the market, but can never be a substitute for the formal system because of their inadequate monitoring capability and enforcement mechanisms (Maksimovic et al 2008). Unfortunately, the comparative advantages of informal financial system in low-income economies have not been empirically tested, and investigations still remain being conducted on a case-by-case basis.

2.2 China's finance-growth puzzle

The studies that examine the relationship between financial development and economic growth in China are mostly conducted at national or provincial level, and typically they discover evidence of resource misallocation. For example, Liang and Tend (2006) use annual aggregate data in 1952-2001 period and find a unidirectional causality from economic growth to financial development. They argue that level of bank credit has not caused economic growth, which suggest the channel of efficient capital allocation is not working well.

Being an original work that raises China as a counterexample to the findings in the law, finance and growth literature, AQQ (2005) contend that the key driver of the country's growth has been the private sector, and this sector tends to rely on informal finance and governance mechanisms rather than formal financing channels. There is also evidence that shows non-state financing sources are generally more efficient in promoting output growth at provincial level between 1985 and 1998 (Liu and Li, 2001).

By contrast, using the recent Investment Climate Survey (ICS) conducted by the World Bank, Cull and Xu (2005) find that the performance of Chinese private enterprises is actually associated with the access to bank loans, along with enterprise managers' risk perception about property rights and local legal conditions. Maksimovic et al (2008), using the same data, also find that firms using formal financing sources grow faster than those financed by alternative channels. They argue that the role of informal financing[ii] and governance mechanisms in supporting the growth of private sector firms is likely to be limited. Similarly, Cheng and Degryse (2007) provide evidence that at provincial level banks contribute more significantly to local economic growth than non-bank financial institutions, especially in the regions with foreign entry. Hence they attribute the improved efficiency of the banking

industry to the ongoing financial reform, and particularly to the commercialization of state-owned commercial banks, the deregulations for foreign entry and liberalization of interest rates.

This apparent dispute regarding the role of formal and informal financing channels in China's economic growth may partially be explained by the different datasets and methodologies used. For example, AQQ (2005) adopt a case study approach and collect data from a survey of 17 entrepreneurs and executives in Zhejiang and Jiangsu provinces. The two provinces in the survey are known for being advanced in terms of the privatization process among the 31 provinces of China. Furthermore, some cities, such as Wenzhou, have a long history of small family business. It is therefore unsurprising to find that informal financing channels based on human connections and reputations are very important in their sample of firms. In contrast, the ICS survey used by Cull and Xu (2005) and Maksimovic et al (2008) displays quite different composition. For example, only 39 firms (3% of the whole sample) are located in Wenzhou.

Empirical studies based on large-scale firm level date start emerging recently, as data become more and more available. Among others, Cull, Xu and Zhu (2007) examine the role of trade credit as an informal financing channel in China, and conclude that it does not play an economically significant role. Even more, it may further decline as the formal financing allocation becomes more efficient. Other studies, mostly conducted at aggregate level or using limited survey data, can hardly give satisfactory explanations to the conflicting arguments. As such, the jury is still out on the relationship between finance and growth in China.

3. Financing Patterns in China

3.1 Financial sectors in China

As in many other developing countries, formal financial sectors and informal financial sectors comprise China's financial system. By schematizing both sectors, Table 1 shows that the formal finance sector covers a wide variety of institutions while the mechanisms and agents of the informal sector are equally diverse.

The formal financial sector can be represented on three levels – the Ministry of Finance, Banks and other financial intermediaries, and capital markets, as the first figure in Table 2. The Ministry of Finance takes a predominant role in the economy by administering macroeconomic policies and the national annual budget, and by handling the fiscal policy and government expenditure. At firm level, state budget appropriations are the direct investment from the state budget by central and local governments.

The second level is composed of various banks and non-bank financial institutions, regulated by the People's Bank of China. They are the major players in the formal sector, which is in fact dominated by four large state-owned commercial banks claiming around 70% market share in terms of both national savings and loans during 1995-2002 (Du, 2006). These banks used to carry some policy-related functions in the past and this partially explains the soft-budget constraint phenomenon (Lin et al, 1998), the large amount of non-performing loans (e.g. Ma and Gung, 2002) and their lack of operational efficiency (Du, 2006; Berger et al, 2008)[iii]. Furthermore, it has been argued that the Chinese banking sector is regionally segmented; financial resources are not mobile and they are allocated inefficiently (Lardy, 1998; Cull and Xu, 2003; Boyreau-Debray and Wei, 2005).

The third level lies China's emerging capital market. Compared to most countries in the world, even developing economies, the Chinese capital market is much smaller in terms of the size of stock market[iv]. The two Chinese stock exchange markets were established in the early 1990s, and by 2004 only 1,337 companies were

listed in the market, which represent only about 1% of the manufacturing industry in terms of industrial value added. The stock market is thus by no means an important financing channel for the majority of domestic firms. Apart from being small, China's capital markets lack efficiency, which may be due to being policy-driven (Heilmann, 2002) or due to ineffective regulations (AQQ, 2005).

Informal financial sectors are comprised of savers, lenders and borrowers that can be individuals, firms or associations that act as financial intermediaries but not regulated by authorities. Three types of informal financial operators are classified: individual moneylenders, associations and partnership firms (see figures in Table 1). As has been previously documented in other developing countries, one of the striking characteristics of the informal financial sector is the importance of personal relationship (Germidies, Kessler and Meghir, 1991). The importance of reputation and relationships in China's private sector alternative financing and governance mechanism is also discussed in depth by AQQ (2005).

Corresponding to the supply side, the majority of Chinese firms are typically financed from a mixture of debt and equity. Bank loans constitute firm's debt, and almost exclusively from domestic banks and non-bank financial intermediaries. Equity, on the other hand, can be distinguished by financing source: from state budget appropriations, self-raised sources and foreign investment. Equity finance from state budget appropriations refer to the appropriations in the budget of the central and local governments earmarked for capital investment. Self-raised finance, often the most important source of finance for many firms, includes firms' finance from capital markets, bonds issued by individual enterprises, individual borrowing and funds channelled through local governments, or other bodies. This is similar to what is referred to as informal finance in Maksimovic et al (2008). In a firm's capital, self-raised finance is reflected as three broad types of paid-in-capital: individual capital,

collective capital and corporate (or legal person) capital. Finally, many domestic firms also finance their activities with funds from foreign investors or other foreign funding sources.

3.2 Financing patterns in China

The role of the four financing resources in China has changed substantially during 1980s and 1990s due to the economic reforms and financial liberation (Liu and Li, 2001). State budgetary allocation, the dominant source of funding in the pre-reformed era, has been substituted by domestic bank loans and self-raised funds. The progression has been particularly facilitated by the SOE reforms, which are characterized by privatization and marketization, continuous financial system reform and regional decentralization. China's open-door policy allowed a considerable level of foreign investment in the capital market, the role of which is increasingly visible in firms' financing mix.

According to our calculations[v], between 1998 and 2005, finance from state budgets, domestic bank loans, self-raised funds and foreign investments accounted for about 10%, 14%, 62%, and 14% of firms' total finance respectively. The role of bank loans in financing firms has diminished over time. In 1998, 50% of firms have bank loans; in 2005 this figure has dropped to 25%. During the same period, the average share of bank loans in total capital has dropped from 22% to 9%, suggesting that firms finance more from alternative funds than bank loans. State budget allocation has also diminished gradually. For example, there are only 6% firms in 2005 that finance from state budget, compared to 33% of total firms in 1998; and the average percentage of the state budget in firms' total capital dropped from 21% to 3%[vi]. Huang (2003) argues that the large amount of foreign direct investment in China is an indicator of indigenous private sector firms' financial constraints. Indeed, foreign investment has become a very important source of financing for Chinese firms, and not only for

private firms. It is therefore surprising that foreign investment seems to be ignored in the recent finance and growth studies in China.

4. Empirical framework and econometric issues

To asses the impact of financing sources on firm growth performance, we specify the following reduced form equation:

$$Growth_{it} = \alpha + \beta' FIN_{jit-1} + \gamma' X_{it-1} + \delta' OWN_{it} + \phi' D_i + \varepsilon_{it}, \tag{1}$$

where firm performance is measured by TFP *Growth* using Levinsohn and Petrin (2003) approach for firm i at time t (see Appendix 1 for further details). *FIN is* a vector of financing source variables: state finance, domestic banks loan, self-raised finance and foreign investments, defined by the share of each source in a firm's total finance[vii]. Since the four shares add up to one, the finance from state budget is set as the base group whenever all four financing sources are present. The vector *X* includes a set of control variables that the literature has found to determine firm growth. It includes firm age and firm size that is measured by total employment (e.g. Evans, 1987a; Geroski, 1995; Carbral and Mata, 2003), firm's initial TFP level that is to test whether firm growth is affected by technological endowment. Finally, *D* is the full set of firm's ownership, industrial, regional and time dummies and ε_{it} is a random error term.

Firm level analyses are often beset by some econometric issues that may introduce bias to OLS estimator, namely heterogeneity, selectivity and endogeneity. In light of these issues, we start estimating Equation (1) using OLS estimator with robust standard errors and we also address firm heterogeneity by applying the outlier robust regression models (Rousseeuw and Leroy, 1987), which offers estimates that are not sensitive to the presence of extreme values and effectively controlling for outliers.

Since firm growth is only observed for firms that have survived, it is necessary to assess and correct the selection bias due to survivorship[viii]. A popular method for correcting selectivity bias is the Heckman approach (1976), which however is not appropriate for panel data models with unobserved heterogeneity. Nevertheless, its extension to linear unobserved heterogeneity panel data models by Wooldridge (1995) can identify the extent of selectivity bias in the model. The procedure is a two-stage estimator: in the first stage, non-selection hazard variables are estimated by a sample selection model of firm survival on a yearly basis, which are included in the original model to correct for the selectivity bias at the second stage. The variables included in the selection equations are quadratic terms of firm size and age, TFP level, firm export and innovation activity and industry exit rate. These are variables that are typically used in the firm survival literature (e.g. Dunne and Hughes, 1994 and Mata et al., 1995).

Notwithstanding the fact that the financial source variables are lagged by one period, there may still be the possibility that firms' capital structure is correlated with some unobserved factors that also influence firm growth. Consequently we may face the endogeneity problem induced by multiple endogenous variables with discreteness (finance source variables are truncated). In this case, Wooldridge (2003, 2005), show that the usual IV or control function estimators, such as Smith and Blundell (1986) and Rivers and Vuong (1988), fail to deliver consistent estimates in this case. To our best knowledge, the only available econometric technique for tackling such a problem is the correction function approach of Wooldridge (2005), which is an extension to the standard IV estimator. The study has shown that augmenting the baseline model, such as Equation (1) with appropriately defined *correction functions* will deliver consistent estimates of the parameters of interest.

Assume FIN_j (j=1,2,3) are the truncated finance structure variables[ix], which take standard Tobit reduced forms:

$$FIN_{ij} = \max[0, \vartheta_0 + \vartheta_1 X_i + \vartheta_2 Z_i + \xi_i] \qquad (2)$$

where $[\xi \mid X, Z] \sim$ iid N $(0, \sigma^2)$, and X is the vector of covariates described in equation (1). Z is the vector of the available instrumental variables, for which $E(Z'X) = 0$, or in other words they are assumed to be exogenous and redundant in determining firm growth in the structural conditional expectation. Wooldridge (2005) shows that, ignoring the individual firm indicator, the correction function for models with truncated endogenous variables can be generated as:

$$h_j(X, Z, \vartheta) = \sigma^2 \cdot \Phi(r\vartheta/\sigma), \ r_i \equiv (1, x_i, z_i) \text{ and } \vartheta \equiv (\vartheta_o, \vartheta_1, \vartheta_2), \qquad (3)$$

where $\Phi(.)$ is the cumulative normal density. Then Equation (1) can be modified by adding the correction function and the interaction terms of the endogenous variables *FIN* with the mean variance of each element of the vector *X*, for the omitted variable bias that plagues the usual IV estimators :

$$Growth_{it} = \alpha + \sum_j \beta_j' FIN_{ijt} + \chi' X_{it} + \sum_j \delta_j' FIN_{ijt}(X_{it} - \overline{X}_t) + \sum_j \rho_{ijt} h_{ijt} + \varphi' OWN_{it} + \phi' D_i + \varepsilon_{it} . \quad (4)$$

Equation (4) is then estimated by OLS with corrected standard errors by bootstrapping to account for the fact that correction functions are the generated regressors. A test of joint significance of the correction functions and the interaction terms provides a test of exogeneity of the finance variables.

To estimate correct functions, we need to provide valid instrumental variables that are relevant and exogenous to firm growth. To this end, we employ firms' political affiliation indicators, regional level or industrial level indicators of market condition, financial development and legal environment. *Political affiliations* are a set of dummy variables indicating the administrative level at which firms are being 'supervised'. More than half of Chinese firms (including private firms) are affiliated

to some level of governments, and the affiliations may affect firm's finance structure. For example, the association with government agencies can help obtain credit guarantees or collateral assets that banks demand (see, Huang, 2003). It is noteworthy that political affiliations are normally assigned to firms when they are established and therefore they can be considered exogenous to the error term of the current growth process.

At 3-digit SIC level, the instrumental variables *SOEs share* and *Private share* are defined as SOEs' and private firms' market share within the corresponding 3-digit SIC industry and province in terms of industrial sales. These instrumental variables are designed to capture the market and political environments, which may influence firms' access to financing sources. For example, in the presence of soft-budget constraint (Lin *et al*, 1998), non-SOE firms in a region and industry with high concentration of SOEs would find it relatively more difficult to obtain funds from state budgets and bank loans.

By the same token, firms in industries or provinces that are more open to non-state sector investment can reasonably be assumed more likely to access foreign finance. At regional level, we include indices of regional financial development, financial market competitiveness, asset allocation marketization, difficulty in attracting FDI, and legal environment (measured by the number of lawyers over population). In the macro econometric literature, some of these variables are shown to be good instruments for the access to finance variables (e.g. Levine, 2005).

It is worth noting that these variables by nature are exogenous to firm level growth performance for the way their being constructed. To test the relevance of the instruments, we implement the Kleibergen-Paap (2006) rank test (rk test in the table) for the rank condition $rank(Z'X) \geq k$, which is a generalization of the Anderson Canonical correlation rank test (Anderson, 1984) and closely related to the minimum-

eigenvalue test statistics proposed by Cragg and Donald (1993) (also see Hall, Rudebusch and Wilcox, 1996)[x].

5. Data and summary statistics

Our data draws on the Annual Reports of Industrial Enterprise Statistics compiled by the National Bureau of Statistics (NBS) of China, covering the population of Chinese state-owned manufacturing enterprises and non-state-owned enterprises with annual turnover more than 5 million RMB Yuan (about $620,000). The sample accounts for nearly 90% of total industrial output. The dataset employed in this paper spans the period of 1998-2005, containing detailed information such as inputs, output, source of finance, exports, product innovation as well as the ownership structure, industry affiliation, geographic location [xi]. The data exhibit a good balance across the manufacturing industries and provinces in China, as shown in the Appendix Table 1. At regional level, financial development is measured by private credit (credit to the private sector) over regional GDP, to capture the degree of regional financial development (following King and Levine, 1993). We also have several regional indices using the National Economic Research Institute (NERI) Index of Marketization of China's Provinces 2004 Report, which is based on statistical census and survey data during 2001-2002 (Fan and Wang, 2005).

Traditionally firms' ownership is classified according to the Regulation of the People's Republic of China on the Management of Registration of Corporate Enterprises. This classification has been questioned recently (e.g. Dollar and Shang-Jin Wei, 2007), given that ownership changes among Chinese enterprises have frequently taken place during the reforms period. This motivates us to define a more reliable ownership composition measure based on the share of equity capital contributed by different sources, such as the state, collective investors, domestic

private and foreign investors. Specifically, the ownership is classified as: (1) State-owned enterprises (SOE): if state budget is the major source of capital, which means if state budget is equal to or more than 50% of equity finance; (2) Collective enterprises (COE): if collective capital is equal or more than 50% in equity finance; (3) Foreign invested enterprises (FOR): if foreign capital (incl. capital from Hong Kong, Macau, and Taiwan and foreign countries) is the major source of capital, which means if foreign capital is equal to or more than 50% of equity; (4) Domestic private enterprises (Private): all domestic firms which are not classified as SOEs or FORs. This group can further be split into three sub-groups: (4a) Private with state capital (Private_state): if state capital is less than 50% in equity finance; (4b) Private with foreign capital (Private_for): if foreign capital is less than 50% in equity finance and there is no state capital; (4c) Pure private (PPrivate), private firms without any state or foreign finance.

The data structure in terms of firm ownership is summarized in Table 2. The majority (56.17%) of the firms in the sample are private firms, 48.13% of these are pure private firms. There are relatively few private firms with state capital (2.66%) and private firms with foreign capital (5.38%). The average percentage of SOEs in the sample over 1998-2005 is 17.16%, but the figure has dropped from 34% in 1998 to 5% in 2005 (not presented in the table), mainly because of SOEs' privatisation and a large-scale entry of non-state firms. Also 13.51% of the firms are COEs and 13.17% are FORs, 60% of which are mainly financed by investors from Hong Kong, Macau and Taiwan. Partially due to the way ownership is classified; the financing pattern reflects firm's ownership structure (Table 3). Only firms with state ownership[xii] (SOEs and private firms with state capital) employ all four financing sources; firms with foreign ownership use three sources except state finance. It is noticeable that firms with state ownership enjoy the greatest access to bank loans. Self-raised finance

supplies the vast majority of finance to collectively owned enterprises (82.48%) and pure private firms (87.9%). It is also interesting to see that foreign investment does not only finance foreign firms, but also domestic private firms (18.85% for private firms with state capital and 27.95% for private firms with foreign capital) and even SOEs (1.66%).

Table 4 provides the summary statistics of the variables used in this paper. Total factor productivity (TFP) measure is estimated following the methodology of Levinsohn and Petrin (2003). This approach has been applied widely in the recent productivity literature because its allows to control for the simultaneity between firm's choice of input levels and unobserved productivity shocks[xiii]. The average TFP growth reaches 8.3% over the sample period, with a high standard deviation indicating substantial heterogeneity among firms. Employment, however, dropped by of 3.6% during the examined period, mainly due to layoffs in SOEs caused by the process of privatization and marketization.

The average firm age is approximately 10 years, and the average firm size in the sample, measured as the logarithm of total employment, is 4.837 (equal to 126 employees). On average the market share of state sector in 3-digit SIC classified industrial level is 13%, and private sector is 57.3%. Overall, more than half of the firms in our sample show political affiliations at some level. Around 7% of the firms are affiliated with either the central government or provincial governments, and nearly 10% with regional governments; the rest 44% are affiliated with lower level (i.e. prefecture, county) governments.

Finally, Table 5 shows the spearman rank correlation coefficients of finance variables with other variables. The variables listed on the left hand side of the table are the additional instrumental variables used in the correction function approach. They are correlated monotonically with the finance variables significant at various

degrees, with one exception of foreign finance variable and the affiliation to central and provincial government.

6. Empirical Findings

6.1 Does financing source make difference to TFP growth?

Table 6 presents the estimation results based on the full sample using the four econometric modelling techniques discussed in Section 4. Notably financing source variables, *Bank Loan*, *Self-raised finance* and *Foreign finance*, obtain positive and highly significant signs relative to *State budget* (which is the reference group) across estimators. Column (1) presents the baseline model estimates using OLS with White's robust standard errors. Relative to state budget, three other finance variables have similar marginal effects on firm TFP growth (around 6%). Column (2) presents the outlier robust regression estimates that report lower effects of finance variable, suggesting that the OLS results might have been driven by the fast growing individual firms in the sample. The correction of survival selectivity alters the relative magnitude of the marginal effects of bank loan and self-raised finance in Column (3). In Column (4), the null hypothesis of exogeneity of finance is emphatically rejected, vindicating the application of the correction function approach. The Kleibergen-Paap heteroskedastic robust rank condition test suggests the strong relevance of the additional instrumental variables employed. Controlling for the endogeneity of finance variables, the correction function estimates tell the same story with the selectivity correction estimates about the relative importance of the four financing sources. Although it is unfortunate that there is no available method that combines selectivity correction and endogeneity correction in our case with multiple truncated endogenous variables, both estimators that deal with the econometric issues deliver qualitatively the same message - the results strongly suggest that the source of finance

matters for firm growth. At national average level, foreign finance leads to the highest TFP growth rate, followed by self-raised finance and then bank loans during the examined period, all else being equal.

Turning to control variables, across all estimators, we find that the initial TFP level enters with a negative and significant coefficient, suggesting that productivity convergence is taking place (Table 6). Younger firms tend to grow faster, as both age and age-squared register negative and significant signs. We also uncover a U-shaped relationship between firm size and growth. Although the literature on the relationship between firm size and growth is inconclusive (Geroski, 1995), our finding is in line with the existing empirical evidence from emerging countries (e.g. Konings and Xavier, 2002). The coefficients of ownership dummy variables consistently show that non-SOEs grow much faster than SOEs, and the fastest growing ones are pure private domestic firms and foreign-invested firms.

6.2 Financing source, TFP growth and ownership

Next we investigate how the relationship between financing source and TFP growth differs across ownership types. The findings discussed below are based on the correction function estimates by ownership as reported in Table 7. We also provide the selection model estimates for comparison in the Appendix Table 2. Reassuringly, as in the full sample estimation case, the two sets of results are qualitatively the same. It is worth mentioning that as we split the sample by ownership, the base group of finance variables needs to be reset because not all firms are financed from the state budget. For example, COEs are financed only from bank loans and self-raised finance, thus, the marginal effect of bank loan is then estimated relative to that of self-raised finance.

We find that the relationship between financing sources and firm TFP growth is heterogeneous across ownership types. In Table 7 Column (1), SOEs with higher proportion of bank loans in the financing mix tend to be poor performers, while foreign finance has the most pronounced positive impacts. A 10-percent point increase of foreign finance in a SOE's capital is associated with a 2.61 percent increase in the TFP growth. SOEs are not the only firms which foreign finance has prominent effect. As reported in Column (3), for private firms with some state finance (Private_state), foreign investment appears to be the only significant financing channel leading to productivity growth. By contrast, domestic bank loan seems working well for foreign-invested firms, both private domestic firms with some foreign investment (Private_for in Column (5)), and foreign-owned firms (FOR in Column (6)). Self-raised finance is found to be more important than bank loan for the performance of COEs and pure private firms (PPrivate).

6.3 Financing source and employment growth

TFP growth is likely to be related to technology advancement, management efficiency and skill-upgrading leading to long term development. In the short term, firm growth through employment creation could also be a desirable social objective. Accordingly, we analyse the role of financial structure in driving employment growth. The results of the full sample estimation by ownership are reported in Table 8. Overall, we confirm the results reported earlier that financial structure matters for firm growth. Interestingly, we discover a somewhat different pattern from what is found in the case of TFP growth.

We find that that, among four financing sources, domestic bank loans play a much more positive role in driving firms' employment growth than in driving TFP growth. For the full sample in Column (1), COE in Column (3), private firms with

state capital (Private_state) in Column (4), PPrivate in Column (5) Private_for in Column (6) and FOR in Column (7), bank loans have the largest significant positive effects on employment growth. Comparing horizontally across ownership types, we find that the marginal effect of bank loans tend to be higher for firms with state funds than firms without state funds, and it is the smallest for pure private firms. For SOEs, foreign investment (with marginal effects 0.0676) has slightly greater impact than bank loans (with marginal effects 0.0512).

Also in Table 8, the control variables in the employment growth equation confirm the U-shaped relationship not only between firm size and growth, but also between firm age and employment growth. We find that the capital intensity enters with a positive and significant coefficient for the full sample, COE, pure private firms, and foreign firms, suggesting that more capital intensive firms tend to grow faster in employment.

6.4 The complementarities between financing channels

Summarizing the findings so far, we have shown that there are strong complementarities between the financing channels examined, particularly between domestic finance and foreign finance, as well as between bank loans and self-raised finance. The overwhelming majority of Chinese firms have mixed financial structure and the relationship between finance and growth contingent on ownership and growth channel. For example, firms with state ownership (SOEs and Private_states) seem to benefit the most from foreign finance, while domestic bank loans appear to foster the highest growth among foreign-invested enterprises. This pattern may imply complementarities between foreign and indigenous capital. It is not difficult to find plenty theories and evidence that in host counties foreign investments generate productivity spillover effects through innovation, management and marketing

channels and competition effects. Especially in China, it is believed that by attracting FDI firms gain easier accesses to some scarce resources, not only finance, but also land, entry to certain markets and preferential treatments from the government (Chun and Chen, 2008). Likewise, foreign-invested firms may benefit to some degree from getting connections with local financial intermediaries through borrowing bank loans.

Self-raised finance is more efficient at driving growth than bank loans for COEs and pure private firms, which are arguably the most financially constrained firms in China. This result support AQQ's argument (2005) with empirical evidence that the private sector that contribute greatly to the economy depends upon alternative financing channels and governance mechanisms. As such, self-raised financing channels have played an important role in facilitating the economic growth by complementing formal financial channels through bank loans. Its existence is not only necessary but also critical.

Where do our findings stand in the context of the recent debate regarding the relative importance of China's formal and informal financial systems in supporting firm growth? AQQ (2005) argue that China's economic growth is largely due to the performance of private sector firms that heavily rely on informal finance. By contrast, Maksimovic et al (2008) find firms financed by formal bank loans grow faster. Based on a large dataset covering virtually the population of SOEs and a large chunk of non-state firms, and on econometric techniques that tackle the potential endogeneity of the finance variables, our finding strongly suggests that it is too sweeping to draw a conclusion that the formal financial system is more important than informal one or vice versa. It is the mixture of various financial arrangements and agents from which the Chinese industrial firms have benefited. Perhaps what matters in the end is not the specific channel of finance, but the 'structure' of finance.

6.5 The role of state-owned financial arrangements

Interestingly, among SOEs and Private_states that are partially financed by the state, there is no statistical evidence to suggest that bank loans have played different role from the state budget in promoting firm's TFP growth. In fact, both channels are found to be less efficient in driving growth than self-raised finance and foreign finance (Table 7 Column 1 and 3). This supports the theory of the property rights of state-owned financial institutions for transitional economies (Majumdar, 1996a; 1999). From the perspective of corporate governance, it contends that property rights of financial capital are attenuated in state-owned financial institutions because the market for corporate control is inadequate or absent. The relationships between firms, banks and government are often intertwined and obscure. This induces agency problems and may result in a negative association between firms' leverage and performance.

Consider in our case, that bank loans are mainly issued by China's four state-owned commercial banks that only evolved into commercial banks in the post mid-1980s, after acting as the state's cashier for over thirty years. Although the recent reforms and development in the state banking sector have been dramatic, such as transferring billions of nonperforming loans to four Assets Management Companies and listing state-owned banks in stock markets that aimed to recuperate the asset structure, it is not hard to believe that these banks still bare historical burdens of underperforming SOE customers. With the property right of being state-owned, these banks may have a long way ahead before they are totally independent through privatization. Until then their existence could be inevitably multiply oriented – serve its owner in all possible ways. Indeed from our results, the evidence suggests that bank loans and state budget are the most employment growth-promoting financing channel for SOEs (Table 8). More broadly, there also seems to be a pattern that

foreign finance and self-raised finance are more likely to be associated with TFP growth, while bank loan appears more likely to be associated with employment growth.

The performance of bank loans, however, can be rather different for the non-state sector. The finding that domestic bank loans help foreign-invested firms grow more efficiently indicates that the reforms in the financial system in recent years might have improved the ability of Chinese banks' financial resource allocation.

7. Conclusion

Using a comprehensive firm-level dataset with 1.46 million observations spanning the period 1998-2005, this paper depicts a detailed picture of China's financial sectors and industrial firms' financing pattern, and provides a thorough investigation of the relationship between financing source and firm growth. We ask two questions. First, does financing source matter to firm growth? And second, if it does, which is the most important financing source? The answer to the first question is an emphatic yes, although this does not tell the whole story. As for the second question, at national level, we find that controlling for the endogeneity of finance variables, and all else being equal, foreign finance leads to the highest growth rate in the examined period. Self-raised finance and domestic bank loans follow next, while state budget finance is the least efficient financing source in driving firm growth. The relative importance, however, depends greatly on ownership types and to some degree on growth channel (in TFP or employment). Overall, there are well-built complementarities between formal financing channels and informal ones, as well as between domestic finance and foreign investment. Nevertheless, given the sheer importance of informal financial arrangements in the economy, it is misleading to draw any conclusion about

China's financial system without taking both formal and informal financial system into account.

The next obvious question would be what is the mechanism in which each financing channel works to facilitate growth for different types of firms to reach such complementarities? The theory has formally provided us some thoughts, including the mechanism of peer monitoring system of informal financial system in low-income countries (Stiglitz, 1990; Arott and Stigltz, 1990). Other possible mechanisms that differentiate and characterize informal financial arrangements from formal ones, such as information sourcing agency and financial service pricing, will need to be theorized formally and examined with extensive evidence.

If our understanding of the complementarities is correct, a policy implication for China's current economic reform should aim at establishing a broader financial system that is able to support different types of firms' development. An efficient informal financial mechanism not only provides an alternative vehicle for saving mobilisation and financing non-state firms, especially smaller ones, but can also be a catalyst for banking reforms by exposing state banks to market competition. Some thoughts should also be given on how does the relationship of financing source and growth evolve during firm's life cycle. In further work (Du and Girma, 2008), we provide a preliminary effort on investigating the relationship between financing source, firm growth and firm size.

Reference

1) Allen, Franklin, Qian, Jun and Qian, Meijun, 2005, Law, Finance, and Economic Growth in China, *Journal of Financial Economics* 77, 57-116.

2) Arnott, Richard, and Joseph E. Stiglitz, 1990, Moral Hazard and Nonmarket Insitutions: Dysfunctional Crowing Out or Peer Monitoring, *American Economic Review*, 81:1, 179-90

3) Maksimovic, Volislav Demirgüç-Kunt, Asli and Ayyagari, Meghana, 2008, Formal versus Informal Finance: Evidence from China, World Bank Policy Unpublished research working paper No. 4465. Available at SSRN: http://ssrn.com/abstract=1080690

4) Berger, Allen N, Hasan, Iftekhar and Zhou Mingming, 2008, *Journal of Banking and Finance*, in press.

5) Boyreau-Debray, Genevieve and Wei, Shang-Jin, 2005, Pitfalls of a state-dominated financial system: the case of China, NBER WP 11214, National Bureau of Economic Research, Cambridge, Massschusetts.

6) Cabral, L and J. Mata, 2003, On the evolution of the firm size distribution, *American Economic Review*, 93, 1075-90.

7) Cheng, Xiaoqiang and Degryse, Hans, 2007, The Impact of Banks and Non-bank Financial Institutions on Local Economic Growth in China, Bank of Finland Discussion Paper 22.

8) China Finance Society, *Almanac of China's Finance and Banking* (Annual, various issues), Beijing: China Financial Publishing House.

9) *China Statistical Yearbook* (various issues*)*, National Bureau of Statistics of China.

10) Chun, An and Chen, Lifeng, 2008, The Analysis of the Rational of Informal Financing, *Zhe Jiang Finance*, 6, 49-50. (In Chinese)

11) Cull, Robert and Xu, Linxin Colin, 2005, Institutions, ownership, and finance: the determinants of profit reinvestment among Chinese firms, *Journal of Financial Economics*, 77, 117-146.

12) Cull, Robert, Xu, Lixin Colin, and Zhu Tian, 2007, Formal Finance and Trade Credit During China's Transition, World Bank Policy Research Working Paper 4204.

13) Dollar, David and Wei, Shang-Jin, 2007, Das (Wasted) Kapital: Firm Ownership and Investment Efficiency in China, NBER working paper 13103.

14) Du, Jun, 2006, PhD Thesis: Essays on Banking Efficiency, Access to Finance and Firm Performance in China, University of Leicester

15) Du, Jun and Girma, Sourafel, 2008, Firm Size, Source of Finance and Growth – Evidence from China, mimeo.

16) Evans, D., 1987a, The Relationship between Firm Growth, Size and Age: Estimates for 100 Manufacturing Industries? *Journal of Industrial Economics*, Vol. 35, pp.567-81.

17) Fan, Gang and Wang, Xiaolu, 2005, *NERI Index of Marketization of China's provinces 2004 Report*, National Economic Research Institutes, China Reform Foundation, Economics Science Press. (In Chinese)

18) Germidis, Dimitri, Kessler, Denis and Meghir, Rachel, 1991, *Financial Systems and Development: What Role For the Formal and Informal Financial Sectors?* OECD.

19) Geroski, P.A., 1995, What Do We Know About Entry? *International Journal of Industrial Organization*, 13, 421-440

20) Heckman, J., 1976, The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple Estimator for Such Models, *Annals of Economic and Social Measurement* 5 , 475–492.

21) Heilmann, Sebastian, 2002, The Chinese Stock Market – Pitfalls of Policy-driven Market, Center for East Asian and Pacific Studies, Trier University, Germany.

22) Huang, Yashang, 2003, *Selling China*, Cambridge University Press.

23) King, R., Levine, R., 1993, Finance and growth: Schumpeter might be right, *Quarterly Journal of Economic*s 108, 717–738.

24) Kleibergen, F., and R. Paap. 2006. Generalized reduced rank tests using the singular value decomposition. Journal of Econometrics 127(1), 97–126.

25) Konings, Jozef and Ana Xavier, 2002, Firm Growth and Survival in a Transition Economy, LICOS, Centre for Transition Economics, Catholic University of Leuven, Belgium.

26) Kuijs, Louis, 2005, Investment and Saving in China, World Bank Policy Research Working Paper 3633, the World Bank.

27) La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998, Law and finance, *Journal of Political Economy*, 106, 1113-1155.

28) Lardy, Nicolas R. 2000, When Will China's Financial System Meet China's Needs? Working paper 54, Stanford University.

29) Lardy, Nicolas R, 2006, China's Interaction With the Global Economy, in Garnaut, Ross and Song, Ligang (2006) *The Turning Point in China's Economic Development*, Asia Pacific Press at The Australian National University.

30) Levine, Ross, 2005, 'Finance and growth: Theory and evidence', Forthcoming in *Handbook of Economic Growth*.

31) Levinsohn, J and Petrin A, 2003, Estimating Production Functions Using Inputs to Control for Unobservables, *Review of Economic Studies*, 70, 2, 317-41.

32) Lui, Tung and Li, Kui-Wai, 2001, Impact of Liberalization of Financial Resources in China's Economic Growth: Evidence from Province, *Journal of Asian Economics*, 12, 245-262.

33) Liang, Qi and Teng, Jian-Zhou, 2006, Financial Development and Economic Growth: Evidence from China, *China Economic Review*, 17, 395-411

34) Lin, Justin Yifu and Liu, Zhiqiang, Fiscal Decentralization and Economic Growth in China, 2000, *Economic Development and Cultural Change*, Vol. 49, No. 1, pp. 1-21

35) Ma, Guonan and Gung, Ben S C, August 2002, China's Assent Management Corporations, Bank for International Settlements WP-115.

36) Majumdar Sumit K. 1996, Assessing Comparative Efficiency of the State-owned, Mixed and Private Sectors in India, *Public Choice*. 96, 1-2, 1-24.

37) Majumdar Sumit K. and Chhibber Pradeep, 1999, Capital Structure and Performance: Evidence from a Transitional Economy on an Aspect of Corporation Governance, *Public Choice* 98, 287-305.

38) Mata, J., Portugal, P. and Guimaraes, P., 1995, The survival of new plants: Start-up conditions and post-entry evolution, *International Journal of Industrial Organisation* 13, 459–481.

39) Rivers, D. and Vuong, Q.H., 1988. Limited information estimators and exogeneity tests for simultaneous probit models. Journal of Econometrics 39, 347–366

40) Smith, R and R. Blundell, 1986. An exogeneity test for a simultaneous equation tobit model with an application to labor supply. Econometrica 54, 679-685.

41) Stiglitz, J. 1990. Peer Monitoring and Credit Markets, *World Bank Economic Review*, 4(3):351–66.

42) Wooldridge, J.M., 1995, "Selection Corrections for Panel Data Models Under Conditional Mean Independence Assumptions", *Journal of Econometrics*, 68, 115-132.

43) Wooldridge, JM., 2005, Instrumental Variables Estimation of The Average Treatment Effect in The Correlated Random Coefficient Model, mimeo, Michigan State University Department of Economics.

Appendix 1: TFP estimation method

The total factor productivity (TFP) measure is estimated following the methodology of Levinsohn and Petrin (2003). The advantage of this method lies in controlling for the simultaneity between firm's choice of input levels and unobserved productivity shocks by using firm's intermediate inputs (such as raw materials or electricity) as proxies. Assuming a Cobb-Douglas production function for firm i at time t is:

$$y_{it} = \beta_0 + \beta_l l_{it} + \beta_k k_{it} + \omega_{it} + \varepsilon_{it}$$
$$\equiv \beta_l l_{it} + \phi_t(k_{it}, m_{it}) + \varepsilon_{it}$$

where y is log of value added, which is sales net intermediate inputs (m), l is labour input and k is capital input, and $\phi_t \equiv \phi_t(k_{it}, \omega_{it}) = \beta_0 + \beta_k k_{it} + \omega_{it}(k_{it}, m_{it})$ is an unknown function of capital and intermediate inputs. ϕ_t is strictly increasing in the productivity shock ω_{it}, so that it can be inverted and one can write $\omega_{it} = \omega_t(m_{it}, k_{it})$ for some function ω_t. Levinshon and Petrin (2003) approximate $\phi_t(k_{it}, m_{it})$ by a third order polynomial in k and m, $\sum_{j=0}^{3}\sum_{s}^{3} \delta_{js} k_{it}^j m_{it}^s$ and obtain and estimate of β_l and ϕ_t (up to the intercept) via OLS. This constitutes the first stage of the estimation procedure. At the second stage, the elasticity of capital β_k is defined as the solution to $\min_{\beta_k^*} \sum_i \sum_t \left(y_{it} - \hat{\beta}_l l_{it} - \beta_k^* k_{it} - \varpi_{it}\right)^2$, where ϖ_{it} is a nonparametric approximation $E[\omega_{it} \mid \omega_{it-1}]$. Since the estimators involve two stages, the calculations of the covariance matrix of the parameters must allow for the variation due to all of the estimators in the two stages. Levinshon and Petrin (2003) note that the derivation of the analytical covariance matrix is quite involved, and suggest the bootstrapping procedure to estimate standard errors. In this study 200 bootstrap replications are performed. Once consistent estimates of the input elasticities are derived, the log of productivity can be obtained as $\hat{\omega}_{it} = y_{it} - \hat{\beta}_l l_{it} - \hat{\beta}_k k_{it}$.

The data of industrial value-added and intermediate input are deflated by ex-factory price indices published in the Chinese Statistical Yearbook (1999-2006). The fixed assets data are deflated by fixed asset price indices published in the China Fixed Asset Statistical Yearbook and Chinese Statistical Yearbook (1999-2006). The estimation has been conducted by 2-digit SIC industry categories.

Tables

Table 1: Financial sectors in China

Financial sectors	Firm's financing channel
Ministry of Finance, through central government and local government departments.	State budget appropriations through budget allocation via central and local governments. It would invest in a firm as equity capital from the state.
(I) Formal or regulated sectors — Central Bank (the People's Bank of China) Banks and other financial intermediaries: → Commercial banks → Domestic banks → State-owned commercial banks; Shareholding commercial banks → Foreign banks and agencies → Policy/development banks → Other domestic banks and deposit-taking financial institutions → Housing/building society; Rural credit cooperatives; Urban credit cooperatives (city commercial banks) → Social security institutions and pension funds → Insurance companies → Domestic insurance companies; Foreign insurance companies Capital markets: → Stock market → Bond market → Money market → Foreign exchange market	Bank loans from banks other non-bank financial intermediaries; Finance from capital market, mainly for listed firms in stock markets. This would be reflected as firms' equity capital, although it role is limited, considering there are only 1337 listed companies in the two stock markets in China by the end of 2004, which represent only 1% of the total national industrial value-added, this financing channel.

(II) Informal Savings and Credit Arrangements			
Individual moneylending	Non-commercial arrangements ⟶		Friends, Neighbours, Households
	Commercial credit arrangements	Money-based ⟶	Professional moneylenders, Mobile bankers, Private individuals from upper-income groups
		Land-based ⟶	Landlord
		Commodity based ⟶	Trade-moneylenders; Equipment suppliers; Produce traders; Store owners
Associations	Savings arrangements ⟶		Fixed-fund associations, Mutual aid associations, Savings club
	Combined savings and credit arrangements ⟶		Informal credit unions, Informal savings and loan co-operatives
Partnership firms ⟶	Financial intermediation ⟶		Indigenous banker pawnbrokers; Finance companies; Investment companies; Leasing companies; Hire-purchase companies

Self-raised finance, as one major source of equity capital, broadly includes finance from individual capital, collective capital, and corporate or legal person's capital. There can be an extensive array of channels and mechanisms that operate self-raise finance as indicated in the left.

Note 1: This table shows the structure of domestic financial sectors in China. Panel I and Panel II schematize the formal or regulated financial sectors, and informal financial arrangements and agents. The right-hand side column lists corresponding financial channels available at firm level from each sector, which are also considered in out empirical analysis.

Note 2: The financial channels that is not included in this table but also used by many Chinese firms is foreign investments. See more discussions in Section 3.2 and Section 5.

Note 3: The second Figure is adapted from Germidis, Kessler and Meghir (1991) "Financial Systems and Development: What Role For the Formal and Informal Financial Sectors?", p.86.

Table 2: Ownership structure defined by capital structure during 1998-2005

Ownership	Freq.	Percent
State-owned enterprises (SOE)	250,651	17.16
Collective enterprises (COE)	197,096	13.5
Private enterprises:	820,261	56.17
- Private with state capital (Private_state)	*38,829*	*2.66*
- Pure private enterprises (PPrviate)	*702,873*	*48.13*
-Private with foreign capital (Private_for)	*78,559*	*5.38*
Foreign invested enterprises (FOR)	192,294	13.17
Total	1,460,302	100

Note: The definitions of firm ownership in the table and a detailed description are given in the main text Section 4.3.

Table 3: Financing pattern of Chinese enterprises during 1998~2005

	Ownership	State budget	Equity finance (by sources)		
			Bank loans	Self-raised finance	Foreign investment (incl. from HK, Macau and Taiwan)
Panel II: Value (RMBYuan 100,000)	SOE	240.97	211.60	19.76	4.72
	COE	0	24.86	60.20	0
	Private enterprises:				
	Private_state	149.18	235.48	227.42	49.44
	PPrviate	0	32.55	87.10	0
	Private_for	0	68.20	179.92	30.99
	FOR	0	46.38	23.77	112.90
	Total amount	38.92	66.40	74.17	18.22
		State budget	Bank Loans	Self-raised finance	Foreign investment
Panel I: Share	SOE	66.44%	29.07%	2.83%	1.66%
	COE	0	17.52%	82.48%	0
	Private enterprises:				
	Private_state	21.39%	20.52%	39.25%	18.85%
	PPrviate	0	12.10%	87.90%	0
	Private_for	0	9.22%	62.83%	27.95%
	FOR	0	4.80%	6.93%	88.28%
	Total	9.59%	14.28%	62.35%	13.79%

Note: The figures are calculated using the dataset used in this paper. The reported means of financing sources by ownership in the table are tested for statistical difference by pair wise ownership groups, and the results suggest the access to each financing source is statistically different among firms under different ownership at 1% significant level.

Note: See the definitions of ownership in Table 1.

Table 4.A: Summary statistics: variables at firm level

	overall		SOE	COE	Private _state	PPrviate	Private_ for	FOR
Variables	**mean**	**sd**	**mean**	**mean**	**mean**	**mean**	**mean**	**mean**
Firm growth								
Growth of TFP (gTFP)	0.083	0.643	0.000	0.039	0.050	0.116	0.079	0.098
Growth of employment (gEMP)	-0.009	0.528	-0.064	0.004	-0.009	-0.012	0.022	0.030
Finance variables								
Share of state budget	0.096	0.272	0.664	0.000	0.214	0.000	0.000	0.000
Share of bank loans	0.143	0.26	0.291	0.175	0.205	0.121	0.092	0.048
Share of self-raised finance	0.623	0.426	0.028	0.825	0.392	0.879	0.628	0.069
Share of foreign investment	0.138	0.315	0.017	0.000	0.188	0.000	0.280	0.883
Firm characteristics								
TFP level	1.549	2.209	0.970	1.518	1.562	1.631	1.724	1.736
Size (log of total employment)	4.837	1.205	5.062	4.809	5.495	4.641	5.118	5.131
Age (years)	10.28	11.06	21.93	13.50	13.84	7.83	7.98	7.12
Capital intensity (log of net fixed assets over total employment)	-1.175	0.871	-1.062	-1.180	-1.082	-1.202	-1.244	-1.177
Political affiliations (dummy)								
Affiliation to central government	0.015	0.120	0.064	0.002	0.022	0.007	0.008	0.002
Affiliation to provincial government	0.042	0.200	0.136	0.019	0.103	0.021	0.044	0.028
Affiliation to regional government	0.096	0.295	0.259	0.069	0.295	0.045	0.119	0.093
Affiliation to governments at other levels	0.444	0.497	0.467	0.670	0.445	0.395	0.473	0.356
No affiliation	0.442	0.497	0.069	0.115	0.143	0.610	0.404	0.636

Table 4.B: Summary statistics: variables at regional/industrial level

Variables	**mean**	**sd**
Industrial concentration rate		
Industrial entry rate		
Industrial exit rate		
Market share (in sales) of the state sector by 3-digit SIC	0.13	0.189
Market share (in sales) of the private sector by 3-digit SIC	0.573	0.248
Financial development (bank loans to private sector over regional GDP)	0.008	0.006
Financial market competitiveness	6.268	1.349
Asset allocation marketization	5.677	2.89
Difficulty in attracting FDI	3.731	2.487
Law (total number of lawyers over total population in a province)	5.233	5.111
Intellectual property right protection	5.526	4.964

Table 5: Spearman's rank correlation matrix

Variables	Finance variables			
	Share of state budget	Share of bank loans	Share of self-raised finance	Share of foreign investment
Political affiliations				
Affiliation to central government	-0.1544*	0.0275*	0.0628*	0.0017
Affiliation to provincial government	0.2097*	0.0518*	-0.1307*	-0.0001
Affiliation to regional government	0.2615*	0.1116*	-0.1938*	0.0453*
Affiliation to governments at other levels	0.1246*	0.0933*	-0.0606*	-0.0854*
Regional/Industrial level indicator				
Market share (in sales) of the state sector by 3-digit SIC industry/region/year	0.3175*	0.2222*	-0.1448*	-0.1897*
Market share (in sales) of the private sector by 3-digit SIC industry/region/year	-0.1076*	0.0524*	0.2292*	-0.2755*
Financial development (bank loans to private sector over regional GDP)	-0.0071*	-0.0696*	-0.0072*	0.0615*
Financial market competitiveness	-0.2149*	-0.1304*	0.1229*	0.1039*
Asset allocation marketization	-0.2507*	-0.1784*	0.1395*	0.1414*
Difficulty in attracting FDI	-0.1819*	-0.1833*	-0.0198*	0.2913*
Law (total number of lawyers over total population in a province)	-0.1577*	-0.2042*	0.0232*	0.2359*
Intellectual property right protection	-0.2549*	-0.2107*	0.0589*	0.2668*

Note: * indicate significance level at 1% level.

Table 6: Financing sources and firm TFP growth

Note 1: The dependent variable is firm TFP growth, estimated by Levinson and Petrin (2003) method (see Appendix 1 for details). **Note 2**: The estimator (1) is OLS with the White's robust standard errors. The Estimator (2) is Outlier robust regression, to deal with firm heterogeneity (Rousseeuw and Leroy, 1987). The estimator (3) is the selection model by Wooldridge (1995), as an extension to the standard Heckman selection method. The reported joint significance of yearly nonselection hazard varaibles at the bottom of the table validates the adoption of the method. The estimator (4) is the correction function approach by Wooldridge (2005), applied to correct for endogeneity bias. The reported joint significance of correction function and the interaction terms indicate the existence of endogeneity. The Kleibergen-Paap rk LM test statistics provides an overidentification tests for the included instrumental variables. **Note 3**: All estimations include the full sets of industry (2-digit SIC level), regional dummies (province level) and year dummies, each set of which are jointly significant in all specifications. **Note 4**: [§] indicates that the coefficients of pairwise financing source variables are tested using F-test, and there are statistically significant differences at 1% significance level between the estimates of the coefficients of bank loans and self-raised finance, between those of bank loans and foreign finance, and between self-raised finance and foreign finance. **Note 5**: Standard errors in parentheses for (1) and (2), bootstrapped standard errors in parentheses for (3) and (4),*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Estimator	(1) OLS, robust error	(2)Outlier robust Regression	(3) Selectivity correction	(4) Correction function
Finance				
Bank Loan	0.0699***[§]	0.0507***[§]	0.0732***[§]	0.0373***[§]
	(0.0069)	(0.0046)	(0.0067)	(0.0078)
Self-raised finance	0.0569***[§]	0.0368***[§]	0.0905***[§]	0.0746***[§]
	(0.0067)	(0.0044)	(0.0064)	(0.0074)
Foreign finance	0.0686***[§]	0.0421***[§]	0.114***[§]	0.0969***[§]
	(0.0093)	(0.0064)	(0.0089)	(0.011)
Reference group	State budget	State budget	State budget	State budget
Firm characteristics				
Age	-0.0199***	-0.0119***	-0.0934***	-0.0593***
	(0.0046)	(0.0035)	(0.0044)	(0.0065)
Age-squared	-0.607***	-0.420***	-1.872***	-2.997***
	(0.10)	(0.079)	(0.10)	(0.17)
Size	-0.0709***	-0.0512***	-0.202***	-0.234***
	(0.0050)	(0.0036)	(0.0053)	(0.016)
Size-squared	1.420***	0.921***	2.537***	2.320***
	(0.047)	(0.034)	(0.050)	(0.15)
TFP level	-0.138***	-0.0795***	-0.232***	-0.175***
	(0.0015)	(0.00075)	(0.0018)	(0.0025)
Ownership				
COE	0.0664***	0.0341***	0.0639***	0.0355***
	(0.0055)	(0.0038)	(0.0053)	(0.0060)
Private_state	0.108***	0.0536***	0.113***	0.0927***
	(0.0066)	(0.0048)	(0.0062)	(0.0069)
PPrivate	0.0917***	0.0509***	0.118***	0.130***
	(0.0051)	(0.0035)	(0.0050)	(0.0056)
Private_for	0.116***	0.0668***	0.101***	0.123***
	(0.0062)	(0.0045)	(0.0059)	(0.0067)
FOR	0.115***	0.0659***	0.101***	0.136***
	(0.0076)	(0.0054)	(0.0072)	(0.0082)
Constant	1.019***	0.640***	1.376***	2.179***
	(0.019)	(0.012)	(0.019)	(0.052)
Observations	447354	447354	447688	415304
R-squared	0.10	0.11	0.19	0.12
Joint significance of non-selection hazard variables			F(7,171524)= 3728.64;P-value=0.0000	
Exogeneity test for correction function				Chi(18) = 9609; P-value=0.0000
Kleibergen-Paap rk Heteroskedastic robust Rank condition test				Chi-sq(26)=27125.14; p-value=0.0000

Table 7: Financing sources, TFP growth and ownership: correction function estimates

Note 1: The dependent variable is firm TFP growth, estimated by Levinson and Petrin (2003) method (see Appendix 1 for details). **Note 2**: The estimator of this set of results is the correction function approach by Wooldridge (2005), applied to correct for endogeneity bias. The reported joint significance of correction function and the interaction terms indicate the existence of endogeneity. The Kleibergen-Paap rk LM test statistics provides an overidentification tests for the included instrumental variables. **Note 3**: [§] indicates that the coefficients of pairwise financing source variables are tested using F-test, and there are statistically significant differences at 1% significance level between the estimates of the coefficients of bank loans and self-raised finance, between those of bank loans and foreign finance, and between self-raised finance and foreign finance. **Note 4**: All estimations include the full sets of industry (2-digit SIC level), regional dummies (province level) and year dummies, each set of which are jointly significant in all specifications. Note 4: Bootstrapped standard errors in parentheses for (3) and (4),*** p<0.01, ** p<0.05, * p<0.1.

Groups	(1) SOE	(2) COE	Private			(6) FOR
			(3)Private_state	(4) PPrivate	(5)Private_for	
Finance						
Bank Loan	-0.0196*[§]	-0.0174**	0.0123	0.0073	0.099***	0.1439***
	(0.0108)	(0.0095)	(0.0315)	(0.015)	(0.022)	(0.019)
Self-raised finance	0.0455***[§]		-0.0096		0.044***	-0.0163
	(0.0129)		(0.030)		(0.018)	(0.011)
Foreign finance	0.2611***[§]		0.1632***			
	(0.042)		(0.038)			
Reference group	State budget	Self-raised finance	State budget	Self-raised finance	Foreign finance	Foreign finance
Firm characteristics						
Age	-0.0161	-0.00396	0.00651	0.0162***	-0.116***	-0.104***
	(0.018)	(0.014)	(0.026)	(0.0063)	(0.019)	(0.023)
Age-squared	-0.189	-1.127***	-0.616	-0.980***	2.219***	0.818
	(0.36)	(0.32)	(0.60)	(0.16)	(0.46)	(0.63)
Size	0.00158	-0.181***	-0.124***	-0.110***	-0.0800***	-0.107***
	(0.016)	(0.018)	(0.035)	(0.0090)	(0.019)	(0.018)
Size-squared	1.298***	2.109***	1.803***	1.693***	1.465***	1.554***
	(0.12)	(0.17)	(0.29)	(0.090)	(0.17)	(0.17)
TFP level	-0.160***	-0.170***	-0.139***	-0.133***	-0.132***	-0.170***
	(0.0051)	(0.0043)	(0.0095)	(0.0025)	(0.0051)	(0.0045)
Constant	1.244***	1.793***	1.484***	1.284***	1.308***	1.749***
	(0.083)	(0.077)	(0.15)	(0.041)	(0.086)	(0.075)
Observations	53121	63942	13025	204090	32680	59080
R-squared	0.17	0.19	0.20	0.25	0.21	0.12
Exogeneity test for correction function	Chi(18) = 6610.47;P-value=0.0000	Chi(6) = 1034.56;P-value =0.0000	Chi(18) = 5832.01;P-value=0.0000	Chi(6) =2906.64;P-value = 0.0000	Chi(12) = 3694.50; P-value = 0.0000	Chi(12) =1120.09;P-value= 0.0000
Kleibergen-Paap rk Heteroskedastic robust Rank condition test	Chi-sq(26)=34301.21; p-value=0.0000	Chi-sq(7)=8612.51; p-value=0.000	Chi-sq(26)=34301.21; p-value=0.0000	Chi-sq(7)=8612.51; p-value=0.000	Chi-sq(16)=44893.10; p-value=0.000	Chi-sq(16)=44893.10; p-value=0.000

Table 8: Financing sources and employment growth

Note 1: The dependent variable is firm employment growth. **Note 2**: The estimator of this set of results is the correction function approach by Wooldridge (2005), applied to correct for endogeneity bias. The reported joint significance of correction function and the interaction terms indicate the existence of endogeneity. The Kleibergen-Paap rk LM test statistics provides an over-identification tests for the included instrumental variables. **Note 3**: [§] indicates that the coefficients of pairwise financing source variables are tested using F-test, and there are statistically significant differences at 1% significance level between the estimates of the coefficients of bank loans and self-raised finance, between those of bank loans and foreign finance, and between self-raised finance and foreign finance. **Note 4**: All estimations include the full sets of industry (2-digit SIC level), regional dummies (province level) and year dummies, each set of which are jointly significant in all specifications. Note 4: Bootstrapped standard errors in parentheses for (3) and (4),*** p<0.01, ** p<0.05, * p<0.1.

Groups	(1) overall	(2) SOE	(3) COE	Private (4) Private_state	Private (5)PPrivate	Private (6) Private_for	(7) FOR
Finance							
Bank Loan	0.0618***[§]	0.0512***	0.0140**	0.0670***	0.00930***	0.0350**	0.0370***
	(0.0037)	(0.0063)	(0.0060)	(0.019)	(0.0031)	(0.015)	(0.0099)
Self-raised finance	0.0372***[§]	0.0426***		0.0489***		0.0256**	-0.0184***
	(0.0036)	(0.0077)		(0.016)		(0.011)	(0.0067)
Foreign finance	0.0191***[§]	0.0676***		0.0496**			
	(0.0059)	(0.023)		(0.019)			
Reference group	State budget	State budget	Self-raised finance	State budget	Self-raised finance	Foreign finance	Foreign finance
Firm characteristics							
Age	-0.00976***	-0.0399***	-0.0264***	-0.0116	-0.0326***	-0.0403***	-0.0761***
	(0.0030)	(0.0085)	(0.0071)	(0.018)	(0.0029)	(0.014)	(0.0095)
Age-squared	0.235***	0.847***	0.375**	-0.128	0.663***	-0.263	1.088***
	(0.079)	(0.18)	(0.18)	(0.44)	(0.082)	(0.43)	(0.29)
Size	-0.125***	-0.128***	-0.215***	-0.162**	-0.255***	-0.220***	-0.170***
	(0.0079)	(0.011)	(0.014)	(0.065)	(0.0072)	(0.045)	(0.011)
Size-squared	1.043***	0.949***	1.552***	1.179**	1.966***	1.768***	1.268***
	(0.073)	(0.088)	(0.14)	(0.59)	(0.074)	(0.44)	(0.11)
Capital intensity	0.00276***	-0.000416	0.00324*	0.00159	0.00441***	-0.000710	0.00513***
	(0.00069)	(0.0020)	(0.0017)	(0.0043)	(0.00097)	(0.0028)	(0.0018)
Ownership							
COE	0.00476						
	(0.0030)						
Private_state	0.0339***						
	(0.0033)						
PPrivate	-0.00330						
	(0.0028)						
Private_for	0.0408***						
	(0.0035)						
FOR	0.0414***						
	(0.0047)						
Constant	0.360***	0.673***	0.384***	0.801***	0.739***	0.769***	0.643***
	(0.022)	(0.036)	(0.036)	(0.17)	(0.018)	(0.11)	(0.032)
Observations	708722	86431	96552	19632	371052	43160	91895
R-squared	0.13	0.10	0.11	0.15	0.20	0.24	0.27
Exogeneity test for correction function	Chi(18) = 5119.14;P-value=0.0000	Chi(18) = 4309.73;P-value=0.0000	Chi(6) = 977.06;P-value =0.0000	Chi(18) = 5392.00;P-value=0.0000	Chi(6) =2906.64;P-value = 0.0000	Chi(12) = 2991.13; P-value = 0.0000	Chi(12) =2809.74;P-value= 0.0000
Kleibergen-Paap rk Heteroskedastic robust Rank condition test	Chi-sq(26) = 34301.21;p-value =0.0000	Chi-sq(26) =34301.21; p-value =0.0000	Chi-sq(7) = 8612.51; p-value=0.000	Chi-sq(26) = 34301.21; p-value=0.0000	Chi-sq(7) = 8612.51; p-value=0.000	Chi-sq(16) = 44893.10; p-value=0.000	Chi-sq(16) =44893.10; p-value=0.000

Appendix Tables

A. Table 1: Dataset structure

Table 1.1 By year

year	Freq.	Percent
1998	149,559	10.24
1999	147,060	10.07
2000	148,239	10.15
2001	156,782	10.74
2002	166,809	11.42
2003	181,067	12.4
2004	259,313	17.76
2005	251,473	17.22
Total	1,460,302	100

Table 1.2 By 2-digit SIC industrial classification

sic2	Freq.	Percent
13-Food Processing	95,706	6.55
14-Food Production	39,877	2.73
15-Beverage Industry	27,639	1.89
16-Tabacco Industry	2,313	0.16
17-Textile Industry	122,010	8.36
18-Garments and Other Fibre Products	69,829	4.78
19-Leather, Furs, Down and Related Products	34,303	2.35
20-Timber Processing	28,231	1.93
21-Furniture Manufacturing	15,994	1.1
22-Papermaking and Paper Products	44,966	3.08
23-Printing and Record Medium Reproduction	33,485	2.29
24-Cultural, Educational and Sports Goods	18,365	1.26
25-Petroleum Refining and Coking	10,775	0.74
26-Raw Chemical Materials and Chemical Products	108,354	7.42
27-Medical products	31,803	2.18
28-Chemical Fibre	7,487	0.51
29-Rubber Products	17,212	1.18
30-Plastic Products	65,582	4.49
31-Nonmetal Mineral Products	129,913	8.9
32-Smelting and Pressing of Ferrous Metals	34,986	2.4
33-Smelting and Pressing of Nonferrous Metals	26,786	1.83
34-Metal Products	77,562	5.31
35-Ordinary Machinery	103,484	7.09
36-Special Purposes Equipment	61,092	4.18
37-Transport Equipment	67,947	4.65
39-Other Electronic Equipment	76,420	5.23
40-Electrical Equipment and Machinery	50,153	3.43
41-Electronic and communication appliances	22,793	1.56
42-Meters and office appliances	30,825	2.11
43-Other Manufacturing	4,410	0.3
Total	1,460,302	100

A. Table 2: Financing sources and firm TFP growth: Selection model estimation by ownership

Note 1: The dependent variable is firm TFP growth. **Note 2**: The estimator adopted is the selection method by Wooldridge (1995). This is a modified technique based on Heckman (1976) to suit panel data model like equation (1). The variables included in the selection equations are quadratic terms of size and age, productivity, industry concentration and industry entry and exit rate. These are standard variables used in the firm survival literature (e.g. Dunne and Hughes, 1994 and Mata et al., 1995). The procedure is to estimate a two-stage model, in which the first stage estimates a sample selection model of firm survival to obtain a yearly selection mechanism, and the second stage includes the estimated selection mechanism to correct for unobserved simultaneity. The reported joint significance of yearly selection mechanism variables validates the adoption of the method. **Note 3**: All estimations include the full sets of industry and regional dummies, both of which are jointly significant in all specifications. Standard errors are corrected for clustered firms in parentheses,*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Groups	(1) SOE	(2) COE	Private (3) Private_state	Private (4) PPrivate	Private (5) Private_for	(6) FOR
Finance						
Bank Loan	-0.0205**	0.0474	-0.00713	0.00618	0.103***	0.1652**
	(0.0097)	(0.028)	(0.029)	(0.013)	(0.037)	(0.018)
Self-raised finance	0.0883***		0.0119		0.0695**	-0.152**
	(0.012)		(0.027)		(0.033)	(0.072)
Foreign finance	0.179***		0.142***			
	(0.033)		(0.033)			
Reference group	State budget	Self-raised finance	State budget	Self-raised finance	Foreign finance	Foreign finance
Firm characteristics						
Age	0.0888***	0.153***	0.104***	0.0962***	0.0131	-0.0143
	(0.016)	(0.013)	(0.024)	(0.0056)	(0.020)	(0.023)
Age-squared	-1.452***	-2.910***	-1.738***	-1.592***	0.486	1.092*
	(0.31)	(0.28)	(0.50)	(0.13)	(0.50)	(0.63)
Size	-0.0625***	-0.239***	-0.171***	-0.224***	-0.195***	-0.243***
	(0.012)	(0.018)	(0.032)	(0.0081)	(0.022)	(0.016)
Size-squared	1.635***	2.743***	2.322***	2.623***	2.428***	2.781***
	(0.097)	(0.17)	(0.27)	(0.079)	(0.20)	(0.15)
TFP level	-0.242***	-0.272***	-0.232***	-0.250***	-0.225***	-0.288***
	(0.0049)	(0.0051)	(0.0100)	(0.0027)	(0.0060)	(0.0050)
Constant	0.609***	1.591***	1.231***	1.698***	1.570***	2.445***
	(0.042)	(0.062)	(0.12)	(0.030)	(0.082)	(0.072)
Observations	59299	60795	14161	219608	29754	64071
R-squared	0.16	0.18	0.17	0.23	0.19	0.24
Specification test for selection model	F(7,26466)= 295.55; Prob>F= 0.0000	F(7,30811)= 264.40; Prob>F= 0.0000	F(7,7197)= 94.94;Prob> F = 0.0000	F(7,100563) =3242.45; Prob>F= 0.0000	F(7,12971)= 282.44;Prob >F= 0.0000	F(7,25109) =594.29; Prob>F= 0.000

A. Table 3: Financing sources and firm employment growth: Selection model estimation by ownership

Note 1: The dependent variable is firm employment growth. **Note 2**: The estimator adopted is the selection method by Wooldridge (1995). This is a modified technique based on Heckman (1976) to suit panel data model like equation (1). The variables included in the selection equations are quadratic terms of size and age, productivity, industry concentration and industry entry and exit rate. These are standard variables used in the firm survival literature (e.g. Dunne and Hughes, 1994 and Mata et al., 1995). The procedure is to estimate a two-stage model, in which the first stage estimates a sample selection model of firm survival to obtain a yearly selection mechanism, and the second stage includes the estimated selection mechanism to correct for unobserved simultaneity. The reported joint significance of yearly selection mechanism variables validates the adoption of the method. **Note 3**: All estimations include the full sets of industry and regional dummies, both of which are jointly significant in all specifications. Standard errors are corrected for clustered firms in parentheses,*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

| Groups | (1) overall | (2) SOE | (3) COE | Private | | | (7) FOR |
				(4) Private_state	(5) PPrivate	(6) Private_for	
**Finance**							
Bank Loan	0.0281***	0.00878*	0.0139**	0.0518***	0.0398***	0.0346*	0.0489*
	(0.0032)	(0.0045)	(0.076)	(0.014)	(0.0067)	(0.019)	(0.026)
Self-raised finance	0.0286***	0.000603		0.0458***		0.0284*	-0.0262
	(0.0032)	(0.0061)		(0.014)		(0.017)	(0.025)
Foreign finance	0.0379***	0.0243		0.0503***			
	(0.0048)	(0.016)		(0.016)			
Reference group	State budget	State budget	Self-raised finance	State budget	Self-raised finance	Foreign finance	Foreign finance
**Firm characteristics**							
Age	-0.00699***	-0.00776	0.000271	-0.00143	0.00772***	-0.0213**	-0.0351***
	(0.0019)	(0.0063)	(0.0059)	(0.011)	(0.0025)	(0.0094)	(0.0090)
Age-squared	0.435***	0.486***	0.257**	0.105	0.116*	0.463*	0.740***
	(0.044)	(0.12)	(0.13)	(0.24)	(0.063)	(0.24)	(0.27)
Size	-0.258***	-0.172***	-0.256***	-0.195***	-0.303***	-0.228***	-0.205***
	(0.0029)	(0.0056)	(0.011)	(0.015)	(0.0050)	(0.014)	(0.0098)
Size-squared	1.694***	1.086***	1.711***	1.260***	2.016***	1.466***	1.245***
	(0.026)	(0.046)	(0.11)	(0.13)	(0.049)	(0.13)	(0.092)
Capital intensity	0.00652***	0.00135	0.00713***	0.000314	0.00907***	0.0000367	0.0105***
	(0.00066)	(0.0020)	(0.0018)	(0.0041)	(0.00095)	(0.0027)	(0.0017)
**Ownership**							
COE	-0.0108***						
	(0.0027)						
Private_state	0.0101***						
	(0.0030)						
PPrivate	0.00246						
	(0.0025)						
Private_for	0.0144***						
	(0.0031)						
FOR	0.0293***						
	(0.0040)						
Constant	0.353***	0.145***	0.393***	0.261***	0.453***	0.258***	0.183***
	(0.0079)	(0.017)	(0.032)	(0.047)	(0.014)	(0.043)	(0.037)
Observations	753096	94777	102639	20945	386456	45732	102547
R-squared	0.20	0.08	0.11	0.16	0.22	0.25	0.29
Specification test for selection model	F(7,295789) =17965.47; Prob>F= 0.0000	F(7,40945) = 708.94; Prob>F= 0.0000	F(7,49608) =1207.16; Prob>F= 0.0000	F(7, 10606) = 351.49; Prob>F= 0.0000	F(7,186360) =10923.83; Prob>F= 0.0000	F(7, 19911) = 1492.69; Prob>F= 0.0000	F(7,40559) = 4189.07; Prob>F = 0.0000

[i] The figure is calculated based on the dataset used in this paper. See also the discussion of financing pattern in Section 5 and Table 3.

[ii] As defined in Ayyagai et al (2007), informal financial institutions include non-market institutions such as credit cooperatives, moneylenders, informal credit and insurance, rotating savings and credit associations which do not rely on formal contractual obligations enforced through a codified legal system.

[iii] There is evidence that suggests the inefficiency of the state banking sector can be explained partly by the high cost of labour and operating expenses (Du, 2006).

[iv] See the comparison AQQ (2005) make with the widely referred sample in La Porta, Lopez-de-Silanes, Shleifer, Vishny (1998). For example, China's total value traded over GDP is only 0.11 while the LLSV-sample average is 0.27; its market capitalization over GDP is 0.32 while the sample average is 0.47.

[v] See more details on the dataset used in the paper in Section 5.

[vi] The figures discussed in this section are calculated based on the dataset used in this paper, which is described in Section 4.3.

[vii] Since the four shares add up to one, the state finance is set as the base group whenever all four financing sources are present.

[viii] Due to the characteristics of the data, the survived non-SOEs are those included in the NBS' census, i.e. the firms maintain annual turnover more than 5 million RMB Yuan.

[ix] In case of four financing source variables included, share of state budget is the omitted group in the estimation.

[x] The Kleibergen-Paap (2006) rk LM test is adopted here because of the case of multiple nonlinear endogenous regressors, which rules out the application of commonly used tests proposed by Bound, Jaeger and Baker (1995) for single linear endogenous regressor, Shea (1997) and generalized Anderson's likelihood ratio for multiple linear endogenous regressors, as well as Cragg and Donald test for similar reasons that has been used widely.

[xi] The output data are deflated using industry-specific ex-factory price indices obtained from China Statistical Yearbook (1999-2006). The capital variables are deflated using fixed asset price indices published in the China Fixed Asset Statistical Yearbook (1999-2006).

[xii] The definition of ownership structure is explained in more detail in the Section 4.2.

[xiii] See Appendix 1 for the estimation detail.