

research paper series

China and the World Economy



Research Paper 2007/39

Does the Source of Finance Matter for Firm Growth?

Evidence from China

by

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Acknowledgements

The authors are thankful to the conference participants at the Chinese Economist Society (CES) Annual Conference held in Changsha, Hunan, China in July 2007.

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Abstract

Using a comprehensive micro dataset spanning the period 1998-2005, this paper provides a systematic investigation of the relationship between financial structure and firm growth in China, controlling for the endogeneity of the former. It finds that financial structure does matter 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.

JEL classification: O5, G2

Keywords: China, finance, growth

Outline

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Non-Technical Summary

China has maintained an unprecedented growth for the last thirty years in spite of a financial system that is generally regarded as underdeveloped. Some scholars have tried to explain this apparent puzzle by arguing 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. Other economists beg to differ, and insist that the role of informal financing and governance mechanisms in supporting the growth of private sector firms is limited.

This research paper contributes to this debate regarding the relative importance of formal and informal financing channels in China. Our work shows that it is difficult to draw an unequivocal conclusion that the formal financial system is more important than the informal one, or vice versa. The overwhelming majority of Chinese firms have mixed financial structure and the relationship between finance and growth is contingent on ownership and growth channel.

A policy implication of this work is that China's current economic reform should aim at establishing a broader financial system that is able to support the growth needs of heterogeneous firms. Thus, along with efforts to attract foreign finance and improve the operational efficiency of the state banking system, public policy should also focus on fostering the development of the informal financial system. 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.

1. Introduction

China has maintained an unprecedented growth for the last thirty years in spite of a financial system that is generally regarded as underdeveloped (Lardy, 2000). Hence, some economists cite the case of China as a counter example to the apparent consensus that a healthy financial system is necessary for a country's economic growth (Allen et al, 2005).

A possible explanation for this puzzle is put forward by Allen et al (2005) who argue 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. This view, however, is not universally accepted. Using a recent Investment Climate Survey (ICS) by the World Bank, Cull and Xu (2005) find that the performance of Chinese private enterprises is positively correlated with access to bank loans. Using the same dataset, Ayyagari et al (2007) also find that firms using formal financing sources grow faster than those financed by alternative channels, and conclude that the role of informal financing and governance mechanisms in supporting the growth of private sector firms is likely to be limited.

These contrasting conclusions regarding the relative importance of formal and informal financing channels in China can of course be due to the use of different datasets and methodologies. Allen et al (2005) adopt a case study approach and collect data from a survey of 17 entrepreneurs and executives in Zhejiang and Jiangsu provinces. These provinces are more advanced in terms of the privatization process among the 31 provinces of China. Furthermore, some areas in these two regions, such as Wenzhou, have a long history of small family business. It is therefore unsurprising that Allen et al (2005) find that informal financing channels based on human connections and reputations are important in their sample of firms. By contrast, the ICS survey used by Cull and Xu (2005) and Ayyagari et al (2007) displays quite different features. For example, only 39 firms (3% of the whole sample) are located in Wenzhou in the ICS data.

Given that existing results are based on limited survey data, the jury is still out on the relationship between finance and growth in China. This paper contributes to this debate 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. Besides bank loan and self-raised finance, this dataset allows us to consider other sources of finance, namely state budget and foreign finance, that existing studies did not manage to analyse.

The paper seeks to answer the following two specific questions: (i) Does the source of finance matter for firm growth at all? (ii) If so, which of the available financing sources – state budget, bank loans, self-raised finance and foreign finance – is most important and for what type of firms? These are important questions, because their answers have implications on how best to reform the country's inefficient financial system in a way that is beneficial to all stakeholders. It hardly needs emphasising that a well functioning financial system is crucial for the long-term stability of the Chinese, and by implication, the global economy.

Controlling for the potential endogeneity of the finance variables, we find that capital structure matters for firm growth, but the relationship between financing source and firm performance varies according to firm ownership and growth channel, namely total factor productivity (TFP) and employment growth.

The following section reviews the theoretical arguments as to why financing sources should matter for growth. Section 3 describes the financing patterns of Chinese firms. Section 4 presents the empirical model and data, and discusses methodological issues. Section 5 discusses the findings of the paper. Section 6 concludes.

2. Why should financing sources matter?

Starting with the seminal paper of Modigliani and Miller (1958), the corporate finance literature has sought to explain how financial structure affects firm

performance. Two prominent theories have emerged in this respect. The first is the static trade-off theory (see Harris and Raviv, 1991, for a review), which suggests that a firm chooses a debt–equity mixture that optimises its value, and the resulting ‘optimal capital structure’ is determined by trading off the costs and benefits of equity and debt. The second is the pecking order theory (e.g. Marsh, 1982), which advocates that the order of firm’s preference is internal finance being preferred to debt, and debt being more favoured than share issues. Developed and examined within the context of Western economies, these hypotheses appear to be less relevant for China. Firstly, publicly listed firms constitute only a small fraction of the population of firms¹ and existing models fail to offer useful insights regarding non-listed firms that have quite different capital structure². Secondly, a principal assumption of all these theories that the suppliers of finance are privately owned is unrealistic in the case of China.

In the context of India, Majumdar and Chibber (1999) argue that property rights are attenuated in state-owned financial institutions because the market for corporate control is inadequate. The relationships between firms, banks and government are often intertwined and this induces agency problems that may result in a negative association between firms’ finance and performance.

The literature provides contrasting views regarding the role of informal financial institutions³. Some scholars contend that informal financial arrangements can only play a complementary role to formal financial systems by serving the low end of the market, and are unlikely to be substitutes for the latter because of their inadequate monitoring capability and enforcement mechanisms (Ayyagari et al 2007). By contrast, the theories of Stiglitz (1990) and Arott and Stiglitz (1990) suggest that informal financial systems in low-income economies have comparative advantages in monitoring firms.

1 By 2004, there were only 1,337 listed firms in China, which are around 0.6% of total industrial firms (calculated based on China Statistical Yearbook 2005).

2 For example, non-listed firms simply do not have share issues.

3 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.

3. Financing Patterns in China

China's financial system is dominated by four large state-owned commercial banks that enjoy around 70% market share in terms of both savings and loans during 1995-2002 (Du, 2006). These banks used to carry policy-related function (and may still do), which partially explains the soft-budget constraint phenomenon (Lin et al, 1998), and the large amount of non-performing loans (e.g. Ma and Gung, 2002), as well as their operational inefficiency⁴. Furthermore, it has been argued that the Chinese banking sector is regionally segmented, financial resources are not mobile and they are allocated inefficiently (Boyreau-Debray and Wei, 2005).

China's capital market is rather small by international standard. Compared to most countries in the LLSV-sample⁵, China is much smaller in terms of the size of its stock market. As Allen et al (2005) show, 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. This is not surprising, considering that the two Chinese stock exchange markets were established in the early 1990s, and by 2004 only 1,337 companies were listed in the two markets. The stock market is therefore not a relevant channel of finance for the majority of domestic firms. Apart from being small, China's capital markets lack efficiency, due to ineffective policies and regulations (Heilmann, 2002; Allen et al., 2005).

The majority of Chinese firms are typically financed from a mixture of state budget, bank loans, self-raised finance and foreign investment. State budget appropriations refer to the appropriations in the budget of the central and local governments earmarked for capital investment. This type of financial allocation has diminished gradually. For example, the average proportion of firms getting state budgets has dropped from 33% in 1998 to 6% in 2005; and the average

⁴ There is evidence that suggests the inefficiency of the state-banking sector can be explained by the high cost of labour and operating expenses (Du, 2006).

⁵ LLSV refers to the widely cited paper of La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998).

percentage of state budget in firms' capital has declined from 21% to 3%⁶ over the same period.

Domestic bank loans are borrowings from domestic banks and non-bank financial institutions. According to our calculations, the role of bank loans in financing firms has declined over time. In 1998, 50% of firms had bank loans and this figure has decreased to 25% in 2005. During the same period, the average share of bank loans in total capital has dropped from 22% to 9%, suggesting increased availability of alternative financing sources.

The third and most important source of finance for many firms is self-raised finance. This includes firms' finance from capital markets, bonds issued by individual enterprises, individual borrowing and funds channelled through local governments or collectives. This is similar to what is referred to as informal finance in Ayyagari et al (2007).

The fourth source of firm finance is foreign investment and it refers to the finance invested as equity capital by foreign investors and funds borrowed from foreign sources and managed by domestic enterprises. It has been argued that the large amount of foreign direct investment in China is an indicator of indigenous private sector firms' financial constraints (Huang, 2003). 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 finance seems to be ignored in existing finance and growth studies in China.

As shown in Table 1, during 1998-2005, finance from state budgets, domestic bank loans, self-raised finance and foreign investment accounted for 9.59%, 14.28%, 62.35%, and 13.79% of firms' total finance respectively (Panel II). It is interesting to note that ownership structure plays an important role in firms' financing mix. We find that only firms with state ownership⁷ (SOEs and private firms with state capital) employ all four financing sources. On the other hand, firms with foreign ownership use all financing channels except state finance.

Not surprisingly, firms with state ownership enjoy the greatest access to

⁶ The figures discussed in this section are calculated based on the dataset used in this paper, which is described in Section 4.3.

⁷ The definition of ownership structure is explained in more detail in Section 4.3.

bank loans. By contrast, 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%).

4. Methodology and data

4.1 Model specification

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

$$Growth_{it} = \alpha + \beta' FIN_{i,t-1} + \gamma' X_{i,t-1} + \delta' OWN_i + \phi' D_{it} + \varepsilon_{it} . \quad (1)$$

In the above equation, *Growth* refers to TFP growth⁸ for firm *i* at time *t*; *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 finance⁹. The vector *X* includes a set of control variables that are hypothesised to impact on firm growth. It consists of quadratic terms of firm age and size (defined as total employment) and initial TFP level (e.g. Evans, 1987; Caves, 1998 and Carbral and Mata, 2003). *D* is the full set of ownership, industrial, regional and time dummies, and ε is a random error term.

4.2 Estimation strategy

Notwithstanding the fact that the finance variables are lagged by one period, there might still exist the possibility of firms' capital structure being correlated with some unobserved factors that also influence firm growth. In this case, the problem of endogeneity would arise, and in order to deal with this issue,

⁸ We also measure firm performance in terms of employment growth by way of robustness analysis.

⁹ Since the four shares add up to one, the state finance is set as the base group whenever all four financing sources are present.

we adopt the modified control function approach (MCF) due to Wooldridge (2005). The detail of this approach is given in Appendix 1, but it worth noting that this method is most appropriate when the endogenous variables are truncated, such as the finance share variables. Wooldridge (2005) shows that if the baseline model such as our growth equation is augmented with so-called *correction functions*, then OLS performed on the extended model will deliver consistent estimator of the vector of parameters of interest.

To estimate control functions, valid instruments are needed. In this paper, we employ three sets of instruments. The first set of instruments consists of dummy variables indicating the administrative level the firms are political affiliated with. A significant proportion of Chinese firms (including private firms) are affiliated with some level of governments agencies that can help them obtain credit guarantees or collateral assets that banks demand (see, Huang, 2003)¹⁰. The second set of instruments are defined at industry-region level, and these are SOEs' and private firms' market share within the corresponding 3-digit SIC industry and province. These instrumental variables are designed to capture the market and political environments, which 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 face relatively more difficulty in getting state budgets and bank loans. Also, firms in industries or provinces that are more open to private investment are more likely to get foreign finance. The last set of instruments are defined at regional level, and it consists of indices of regional financial development, financial market competitiveness, asset allocation marketization, difficulty in attracting FDI, and legal environment (measured by the number of lawyers per capita). In the finance and growth literature, some of these variables proved to be good instruments for finance (Levine, 2005).

¹⁰ Political affiliations are normally assigned to firms when they are set up and are therefore exogenous to the error term of the current growth process.

4.3 Data and summary statistics

Data source and structure

Our dataset 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, ownership structure, industry affiliation, and geographic location¹¹. The data exhibit a good balance across the manufacturing industries (as shown in the Appendix Table 1.2) and provinces in China. 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 NERI Index of Marketization of China's Provinces 2004 Report (Fan and Wang, 2005).

Classification of firms' ownership

Traditionally firm 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-

¹¹ 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).

owned enterprises (**SOE**): if state capital is the major source of capital, which means if state capital is equal or more than 50% in 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 (including capital from Hong Kong, Macau, and Taiwan and foreign countries) is the major source of capital, which means if foreign capital is equal or more than 50% in equity finance; (4) Domestic private enterprises (**Private**): all domestic firms which are not classified as SOEs or FORs. This group can further be grouped into three: (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, most of which 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 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. We calculate that 13.51% of the firms are COEs and 13.17% are foreign invested firms, 60% of which are mainly financed by investors from Hong Kong, Macau and Taiwan.

Summary statistics

Table 3 provides summary statistics of the variables used in this paper. Total factor productivity (TFP) is estimated following the methodology of Levinsohn and Petrin (2003). This approach has been widely applied in recent productivity literature because it can control effectively for the simultaneity between firms' choice of input levels and unobserved productivity shocks¹². Average TFP growth reached 8.3% over the sample period, with a high standard deviation indicating

¹² See Appendix 2 for the estimation detail.

substantial heterogeneity among firms. Employment, however, dropped by 0.9% during the sample period, mainly due to layoffs in SOEs.

5. Empirical Findings

Table 4 reports the endogeneity-corrected econometric estimates from the TFP growth model, based on the overall sample and by firm ownership. In all cases, the null hypothesis of exogeneity of finance is emphatically rejected, vindicating the application of the modified control function approach. Across all sub samples, we find that initial TFP level enters with a negative and significant coefficient, suggesting that productivity convergence has been taking place. The results reveal that younger firms tend to grow faster and a U-shaped relationship between firm size and growth, in line with the existing empirical evidence (e.g. Geroski, 1995).

Turning our attention to the financial structure variables, our results strongly suggest that the source of finance matters for firm growth. For the whole sample, we find that foreign finance leads to the highest growth rate, followed by self-raised finance and bank loans, all else being equal.

It is interesting to note that the relationship between financing source and firm performance is heterogeneous across the different ownership groups. For example, SOEs with higher proportion of bank loans tend to be poor performers, while foreign finance has the most pronounced positive impact amongst this group of firms. A 10 percentage point increase in foreign finance is associated with a 2.61% increase in the TFP growth of the average SOE.

For private firms with some state finance (*Private_state*), foreign investment appears to be the only significant financing channel leading to productivity growth. Interestingly, access to bank loans has its largest impact on private domestic firms with some foreign investment (*Private_for*) and foreign owned firms (*FOR*). On the other hand, relative to bank loans, self-finance is a more important determinant of the performance of COEs and domestic pure private firms (*PPrivate*).

While, TFP growth is likely to be the key to long-term development, in the short term, firm growth through employment creation could be a desirable social objective. Accordingly, we also analysed the role of financial structure in driving employment growth. The econometric estimates are reported in Table 5 and confirm the results reported earlier that financial structure matters for firm growth. However, in contrast to the case of TFP growth, we now find that bank loans play a more prominent role in generating employment growth. For domestic pure private firms (PPrivate), bank loans have significant positive effects on employment growth relative to self-raised finance. For private firms with state capital (Private_state), we find similar effects of bank loans in promoting employment growth, although the highest growth-boosting effects come from foreign investment. The importance of bank loans is also evident among foreign owned firms, as it is the most important driver of employment growth.

So where does our findings fit in the context of the recent debate regarding the relative importance of China's formal and informal financial systems in supporting firm growth? Allen et al (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, Ayyagari et al (2007) find firms financed by formal bank loans grow faster. Based on a large dataset that covers virtually the population of SOEs and a large chunk of non-state firms, and econometric techniques tackling the potential endogeneity of the finance variables, our work shows that it is difficult to draw an unequivocal conclusion that the formal financial system is more important than the informal one or vice versa. The overwhelming majority of Chinese firms have mixed financial structure and the relationship between finance and growth is contingent on ownership and growth channel.

6. Conclusions

Using a comprehensive firm-level dataset spanning the period 1998-2005, this paper depicts a detailed picture of the financing pattern of Chinese firms, and

provides a thorough investigation of the relationship between financial structure and firm growth, controlling for the endogeneity of the former.

The answer to the question posed in the title of this paper is an emphatic yes, although this does not tell the whole story. The relative importance of the different financing sources depends on ownership and growth channel.

A policy implication of this work is that China's current economic reform should aim at establishing a broader financial system that is able to support the growth needs of heterogeneous firms. Thus, along with efforts to attract foreign finance and improve the operational efficiency of the state banking system, public policy should also focus on fostering the development of the informal financial system. 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.

Appendix

Appendix 1: The modified control function approach (Wooldridge 2005)

To deal with the potential endogeneity of the finance share variables that are truncated variables, we apply the modified control function (MCF) approach due to Wooldridge (2005). Wooldridge (2005) shows that if the baseline model such as Equation (1) is augmented with so-called *correction functions* (CF), then OLS performed on the extended model will deliver consistent estimates of the parameters of interest.

Assume $Fin.source_j$ ($j=1,2,3$) are the three truncated finance share variables¹³, which have standard Tobit reduced forms:

$$Fin.source_j = \max[0, \vartheta'_0 + \vartheta'_1 X_i + \vartheta'_2 Z_i + \xi_i]$$

where $\xi_i | X, Z \sim \text{Normal}(0, \sigma^2)$, and X is the vector of covariates determining growth as described in Section 4.1, and Z is a vector of available instrumental variables, also discussed in Section 4.2. Wooldridge (2005) shows that the CF, for models with truncated endogenous variables can be generated as

$$h_j(X, Z, \vartheta) = \sigma^2 \cdot \Phi(r\vartheta / \sigma), \quad r_i \equiv (1, x_i, z_i) \text{ and } \vartheta \equiv (\vartheta_0, \vartheta_1, \vartheta_2),$$

where $\Phi(\cdot)$ is the cumulative normal density. Then Equation (1) of Section 4.1 can be modified as :

$$\begin{aligned} Growth_{it} = & \alpha + \sum_j \beta_j' Finance_{ijt} + \sum_j \delta_j' Finance_{ijt} (X_{it} - \bar{X}_t) + \chi' X_{it} \\ & + \sum_j \rho_j \hat{\sigma}_j^2 \cdot \Phi(r_{ij} \hat{\vartheta}_j / \hat{\sigma}_j) + \lambda D_t + \varepsilon_{it} \end{aligned} \quad (2)$$

Equation (2) can then be estimated by OLS with standard errors corrected through bootstrapping for the fact that the CFs are generated regressors. Wooldridge (2005) shows that a test of the joint significance of the control functions provides a test of exogeneity of the finance variables.

¹³ In case of four financing source variables included, share of state budget is the omitted group in the estimation.

Appendix 2: TFP estimation method

Total factor productivity (TFP) 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:

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

where y is log of value added, which is sales net of 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

estimates 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 $E[\omega_{it} | \omega_{it-1}]$. Since the estimators involve two stages,

the calculations of the covariance matrix of the parameters take variations at both

stages into account. 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.

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Tables

Table 1: 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 I: Value (RMBYuan 100,000)	SOE	240.97	211.60	19.76	4.72	
	COE	0	24.86	60.20	0	
	<i>Private enterprises:</i>					
	Private_state	149.18	235.48	227.42	49.44	
	PPrivate	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	
Panel II: Share		State budget	Bank Loans	Self-raised finance	Foreign investment	
	SOE	66.44%	29.07%	2.83%	1.66%	
	COE	0	17.52%	82.48%	0	
	<i>Private enterprises:</i>					
	Private_state	21.39%	20.52%	39.25%	18.85%	
	PPrivate	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%	

Notes

- (i) The figures given in the table are calculated using the dataset used in this paper.
- (ii) For the definition of ownership categories, see Section 4.3.

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	13.51
Private enterprises:	820,261	56.17
- <i>Private with state capital</i> (Private_state)	38,829	2.66
- <i>Pure private enterprises</i> (PPrivate)	702,873	48.13
- <i>Private with foreign capital</i> (Private_for)	78,559	5.38
Foreign invested enterprises (FOR)	192,294	13.17
Total	1,460,302	100

Table 3: Summary statistics

Variables	overall		SOE	COE	Private_state	PPrivate	Private_for	FOR
	mean	sd	mean	mean	mean	mean	mean	mean
<i>Firm growth</i>								
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
<i>Finance variables</i>								
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
<i>Firm characteristics</i>								
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	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
<i>Regional/Industrial level indicator</i>								
Market share (in sales) of the state sector by 3-digit SIC industry/region/year	0.13	0.189						
Market share (in sales) of the private sector by 3-digit SIC industry/region/year	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 4: Financing sources and firm TFP growth

Dependent variable: TFP growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Overall	SOE	COE	Private_state	PPrivate	Private_for	FOR
<i>Finance</i>							
Bank Loan	0.0508*** (0.0072)	-0.0196* (0.0108)	-0.0174** (0.0095)	0.0123 (0.0315)	0.0073 (0.015)	0.099*** (0.022)	0.1439*** (0.019)
Self-raised finance	0.0608*** (0.0071)	0.0455*** (0.0129)		-0.0096 (0.030)		0.044*** (0.018)	-0.0163 (0.011)
Foreign finance	0.0843*** (0.010)	0.2611*** (0.042)		0.1632*** (0.038)			
<i>Firm characteristics</i>							
Age	-0.0103** (0.0048)	-0.0161 (0.018)	-0.00396 (0.014)	0.00651 (0.026)	0.0162*** (0.0063)	-0.116*** (0.019)	-0.104*** (0.023)
Age-squared	-0.632*** (0.12)	-0.189 (0.36)	-1.127*** (0.32)	-0.616 (0.60)	-0.980*** (0.16)	2.219*** (0.46)	0.818 (0.63)
Size	-0.111*** (0.0059)	0.00158 (0.016)	-0.181*** (0.018)	-0.124*** (0.035)	-0.110*** (0.0090)	-0.0800*** (0.019)	-0.107*** (0.018)
Size-squared	1.731*** (0.055)	1.298*** (0.12)	2.109*** (0.17)	1.803*** (0.29)	1.693*** (0.090)	1.465*** (0.17)	1.554*** (0.17)
TFP level	-0.139*** (0.0017)	-0.160*** (0.0051)	-0.170*** (0.0043)	-0.139*** (0.0095)	-0.133*** (0.0025)	-0.132*** (0.0051)	-0.170*** (0.0045)
<i>Ownership</i>							
COE	0.0247*** (0.0059)						
Private_state	0.0935*** (0.0068)						
PPrivate	0.101*** (0.0055)						
Private_for	0.107*** (0.0066)						
FOR	0.120*** (0.0082)						
Constant	1.421*** (0.026)	1.244*** (0.083)	1.793*** (0.077)	1.484*** (0.15)	1.284*** (0.041)	1.308*** (0.086)	1.749*** (0.075)
Observations	408449	53121	63942	13025	204090	32680	59080
R-squared	0.22	0.17	0.19	0.20	0.25	0.21	0.12
Reference group	State budget	State budget	Self-raised finance	State budget	Self-raised finance	Foreign finance	Foreign finance
Specification test for MCF model	F(4,153137)=196.03; Prob>F=0.0000	F(4,22698)=60.47; Prob>F=0.0000	F(2,27886)=44.56; Prob>F=0.0000	F(4,6504)=8.32; Prob>F=0.0000	F(2,92061)=206.64; Prob>F=0.0000	F(3,11709)=6.94; Prob>F=0.0000	F(3,20932)=20.09; Prob>F=0.0000

Note 1: Standard errors are corrected for clustered firms in parentheses,*** p<0.01, ** p<0.05, * p<0.1.

Note 2: All estimations include the full sets of industry and regional dummies, both of which are jointly significant in all specifications.

Table 5: Financing sources and employment growth

Dependent variable: gEMP	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COEFFICIENT	overall	SOE	COE	Private_state	PPrivate	Private_for	FOR
<i><u>Finance</u></i>							
Bank Loan	0.0367*** (0.0035)	0.0150*** (0.0048)	0.0116*** (0.004)	0.0531*** (0.016)	0.0113** (0.0075)	-0.060*** (0.012)	0.0405*** (0.010)
Self-raised finance	0.0167*** (0.0036)	0.0278*** (0.0072)		0.0366** (0.015)		-0.0310*** (0.010)	-0.0177*** (0.0069)
Foreign finance	0.0217*** (0.0056)	0.0857*** (0.019)		0.0716*** (0.017)			
<i><u>Firm characteristics</u></i>							
Age	-0.0359*** (0.0021)	-0.0302*** (0.0066)	-0.0302*** (0.0064)	-0.0391*** (0.012)	-0.0241*** (0.0029)	-0.0580*** (0.011)	-0.0653*** (0.011)
Age-squared	-0.0651 (0.053)	0.440*** (0.14)	0.277* (0.16)	0.375 (0.28)	-0.542*** (0.081)	0.234 (0.30)	0.392 (0.32)
Size	-0.272*** (0.0033)	-0.184*** (0.0077)	-0.260*** (0.012)	-0.205*** (0.018)	-0.297*** (0.0058)	-0.236*** (0.016)	-0.183*** (0.012)
Size-squared	1.498*** (0.031)	1.174*** (0.055)	1.645*** (0.12)	1.292*** (0.14)	1.596*** (0.059)	1.238*** (0.14)	0.497*** (0.12)
Capital intensity	-0.000747 (0.00070)	0.000242 (0.0020)	0.00400** (0.0018)	-0.00141 (0.0043)	0.0038*** (0.0010)	-0.0056 (0.0050)	0.00890*** (0.0020)
<i><u>Ownership</u></i>							
COE	-0.0136*** (0.0030)						
Private_state	0.0310*** (0.0033)						
PPrivate	-0.00682** (0.0028)						
Private_for	0.0433*** (0.0035)						
FOR	0.0496*** (0.0047)						
Constant	1.020*** (0.011)	0.658*** (0.033)	0.822*** (0.040)	0.697*** (0.064)	1.097*** (0.019)	0.887*** (0.057)	0.790*** (0.045)
Observations	695215	85065	95099	19247	364772	42277	88755
R-squared	0.13	0.10	0.11	0.14	0.21	0.23	0.27
Reference group	State budget	State budget	Self-raised finance	State budget	Self-raised finance	Foreign finance	Foreign finance
Specification test for MCF model	F(4,266919) = 1337.19; Prob>F =0.0000	F(4,34008) = 125.64; Prob >F =0.0000	F(2,44779) = 11.85; Prob >F =0.0000	F(4,9545) = 31.19; Prob >F =0.0000	F(2,173443) = 99.82; Prob >F =0.0000	F(3,18706) = 27.64; Prob >F =0.0000	F(2,34738) = 44.57; Prob >F =0.0000

Note 1: Standard errors are corrected for clustered firms in parentheses,*** p<0.01, ** p<0.05, * p<0.1.

Note 2: All estimations include the full sets of industry and regional dummies, both of which are jointly significant in all specifications.

Appendix Tables

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